

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

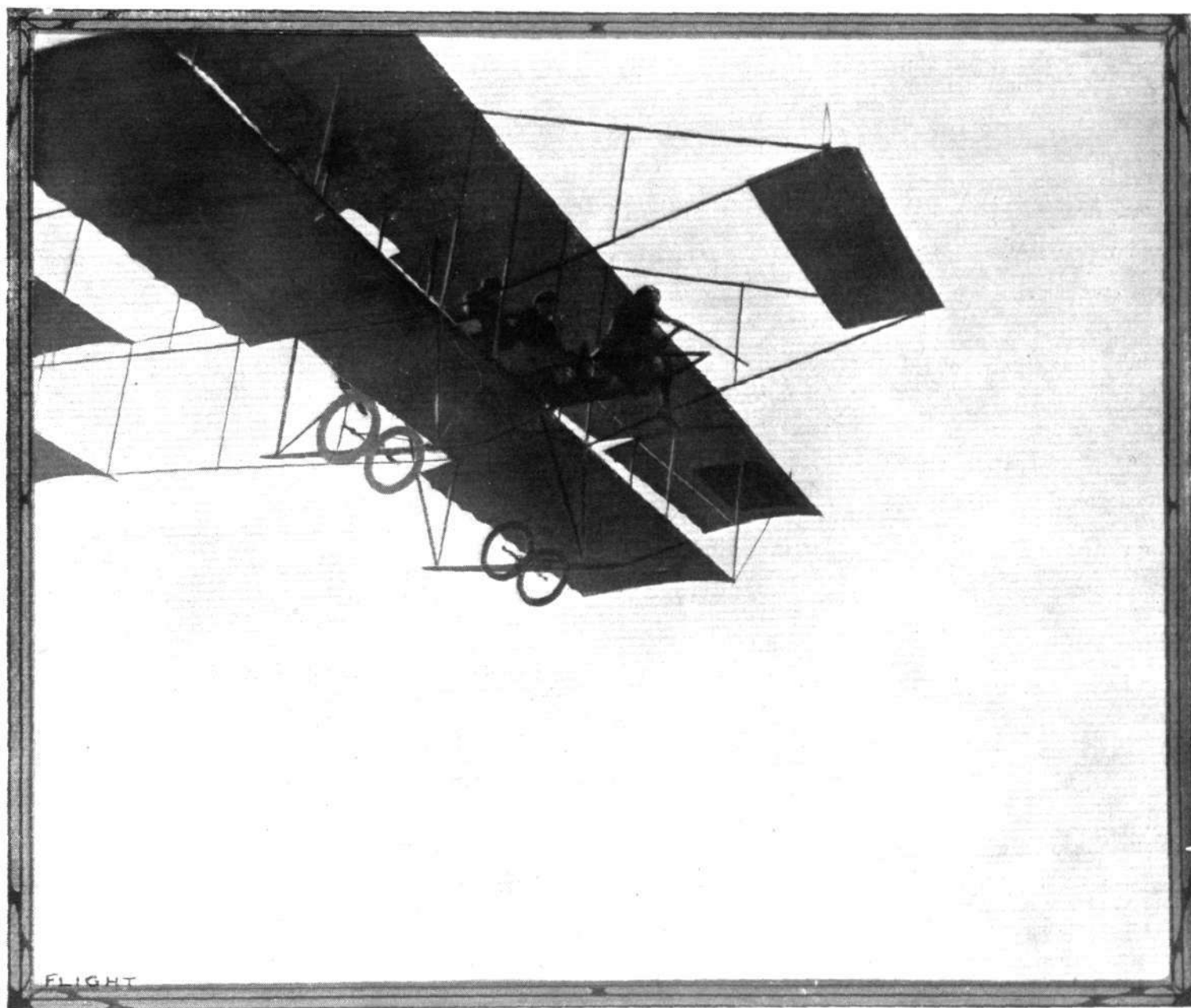
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HARE SHOOTING BY AEROPLANE.—Recently at Corbeaulieu those "heavenly twins," Martinet and Legagneux, have been amusing themselves by shooting hares and partridges from one of their Farman biplanes. The above photograph depicts Martinet, sitting astride the *nacelle*, taking his aim, while behind him are Legagneux, at the lever, and another fellow sportsman in the rear passenger's seat.

EDITORIAL COMMENT.

The Visions of the International Arbitration League.

"There is visions about," and that well-meaning institution, the International Arbitration League, appears to be seeing some of them. While we have the very deepest sympathy with the avowed aims of the League, it is no use disguising from ourselves the elementary fact that its efforts in the cause of international peace and amity do not carry us very far. We may take it as read that in all civilised countries there exists a powerful minority which abhors the god of War and all his works, and believes, rightly enough, that the world would be a better place in which to live if only the rulers and peoples of the earth could be persuaded to do away with the crude arbitrament of war and settle disputes between the nations by the eminently and more satisfactory—and cheaper—medium of arbitration. No one will be found, we imagine, to controvert this broad statement, but, on the other hand, the number of those who can be found to agree as to its possibility would be infinitesimal in regard to the mass. We do not for an instant desire to quarrel with the aims of such societies as the International Arbitration League, because we have every sympathy with its objects, and when it starts out on a campaign directed towards a universal agreement among the Powers that armed air-craft should be banned in the civilised wars of the future, we can find it in our hearts to echo the desire by which it is prompted.

It is such a campaign as that to which we have referred which marks the latest phase of the League's activities, and of which a "memorial of protest" is the outward and visible sign. This memorial bears the names of upwards of two hundred prominent personalities, and appeals to all Governments to work for a common understanding "which shall preserve the world from what will add a new hideousness to the present hideousness of war." It is rightly pointed out that, without universal agreement, no single Power can afford to neglect the new weapon which science has forged. But the memorial points out, the Hague Conference is an accomplished fact, and for the first time, in the face of new developments in the art of war, the machinery to check development is ready to hand.

Thus, continues the memorial:—

"All civilisation protests its desire for peace and goodwill; protests its wish to reduce the already grievous burden of armaments. Unless its protestations be those of a hopeless hypocrite, it cannot stand and watch the conquest of the air, that most glorious of men's mechanical achievements, callously turned to the usages of destruction; it cannot idly acquiesce in a new departure that must heavily increase this burden of armaments.

"There are many who believe that aerial warfare, by reason of its sheer horror, must prove a blessing in disguise, frightening men from war. To those we say civilisation does not sanction the ravages of a new and arrestable form of disease, in order that men through horror may be the more eager to join hands in stamping out all forms of sickness. And further, you underrate the fortitude and adaptability of human nature, which has long proved that it can endure all forms of terror.

"There has never yet been a moment when it was practically possible to ban the war machines of earth or water. There is a moment when it is practically possible to ban those of the air. That moment is now—before the use of these machines is proved; before great vested interests have formed."

All this is very beautiful as a matter of sentiment, but we are much afraid that one main factor—that of human nature—is left entirely out of the calculation. In spite of our peace societies and our arbitration leagues, that same human nature that dominated the affairs of men in the Stone Age is supreme to-day. It is only a few days ago that the skeleton of a man, said to have lived some

thousands of centuries ago, was unearthed in Norfolk. In its measurements and its characteristics generally it differed not at all from the skeleton of the man who died but a decade ago. Away back in the Dark Ages this Norfolk skeleton, which was then a living, sentient being, probably set about the circumvention of his fellows and the annexation of their property with the aid of a stone axe or some equally primitive weapon. It may have been that, according to his lights, he was a man of peace, in which case he simply kept his flint axe in a handy corner of the cave in which he dwelt, simply as a ready means of defence against possible assailants. And, in order that he might have a better chance in the inevitable conflict when the day of wrath arrived, he doubtless expended much time and thought upon the fashioning of his axe, and, perchance, even evolved some sort of weapon which put him on something more than equal terms with those of his fellow men who lacked his industry or ingenuity. What happened? Thought had not advanced to the stage of peace societies, so he was not waited upon by deputations of the patriarchs of the time, which begged him in the name of humanity to discard his new invention. On the contrary, it was voted a good thing for the individual or the tribe, and was adopted and improved upon until something still better was evolved and took its place.

Now the point is, that even as the bodily characteristics of the human race have not materially altered in these thousands of centuries, so have the natural instincts remained unaltered since the dawn of history. It is true that they have undergone an external process of refinement, which leads us all to express horror and loathing at scenes and incidents which were mere commonplaces to our ancestors, and that some of the ultra-refined among us are capable of feeling deeply and genuinely aghast at the use to which many devices and inventions of science are put in the race between nations for the circumvention one of another—for war and the preparation for war simply amounts to this. But these ultra-refined natures are no more normal, as compared with the mass, than are the inmates of the nearest lunatic asylum; and when we come to average things up, we find that the veneer of civilisation is at best a very thin one. Without going quite so far as to say that man's natural instincts lead him to murder, and the appropriation of those things which are not his, whether we regard man as an individual or as a community, the real cause is not very far removed from this. Until all this is changed—until, that is, human nature has undergone a complete change—"memorials of protest" against armaments at large and the components of which they consist, are merely in the nature of pious resolutions which do no one any harm if they achieve little good.

The irony of it is that while two hundred British notabilities are affixing their signatures to this memorial, the French Minister of War is expounding to his Parliament the details of his scheme for spending immediately a round million sterling on air-craft for warlike purposes. Germany is increasing her aerial fleet very largely. Italy is actually using dozens of aeroplanes in her war in Tripoli. Russia, Spain, Japan, China, America, Turkey—all the Powers of the earth, in fact—are buying aeroplanes to be used against the next enemy! It may be both deplorable and pathetic that immediately science succeeds in giving us something new, the first question to be answered is that of whether or not it can be turned to the purposes of wholesale murder—but then, that is human nature once more.

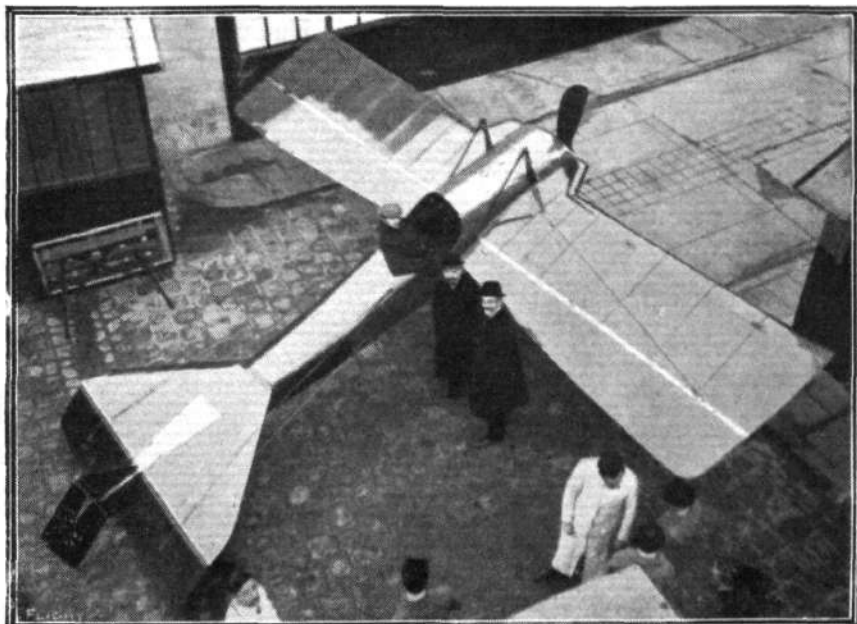
THE 100-H.P. DEPERDUSSIN RACING MONOPLANE.

THE performance of that magnificent pilot, Vedrines, mounted on this new product of the Deperdussin firm, in establishing a new set of world's speed records from 5 to 150 kiloms., is yet another fact in support of our oft-repeated assertion that the organisation of Armand Deperdussin is one of the most enterprising and vigorous among the French industry. The machine with which this feat was accomplished has for some considerable time past been the special study of their chief engineer, M. Béchereau, one who has earned considerable respect in France, and even on this side of the Channel, by his most original and sound ideas. In order to arrive at the phenomenal speeds of which this machine has proved itself capable, the designer has in no way sacrificed any of its inherent qualities of safety in order to achieve his end. He has sought to attain the solution of the problem by reducing the head resistance of the machine as a whole to a minimum and by special study of the wings, rather than by any such inadvisable expedient as reducing the supporting surface.

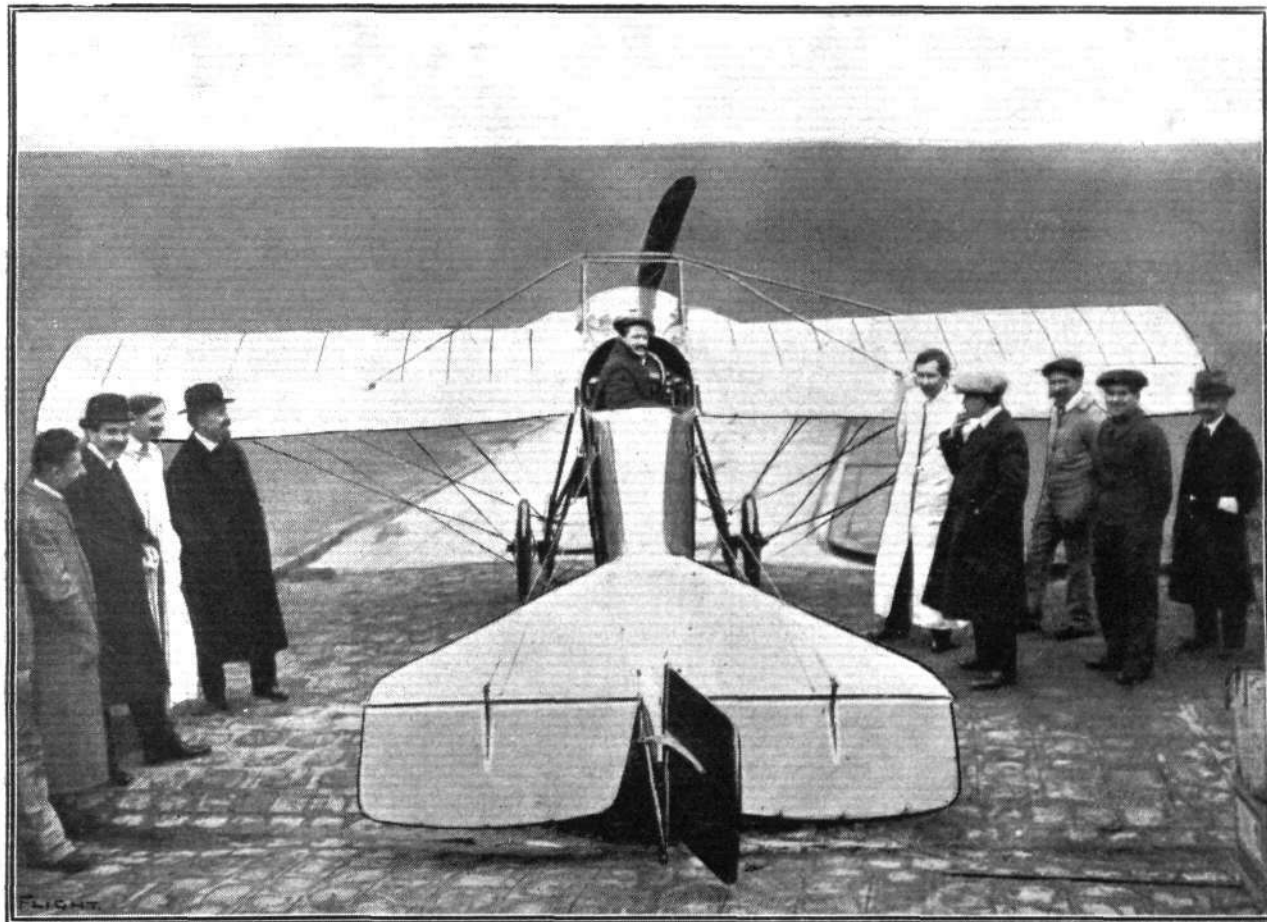
The growing trend of opinion in favour of the torpedo type of body has gained another adherent, for in the machine at present under review this feature has been incorporated for the first time in the Deperdussin design. The main body proper consists of a lattice girder which tapers towards the rear, of exactly the same type as, but of more generous dimensions than, that employed on the ordinary type of machine. Throughout its whole length this girder is encased by a shell of three-ply wood, enough being cut away on a level with the back of the wings, in order to accommodate the pilot.

The form of the wings is rather peculiar in view of the general acceptance of the tapering tip. In the case of this machine, however, the wing tapers from the tip to the root, butterfly-like, a system which has some points to commend it, in that the chord is least where the relative current of air is strongest, and that the enlarged ends of the wings are better able to counteract the tendency of the engine torque reaction to interfere with its natural balance.

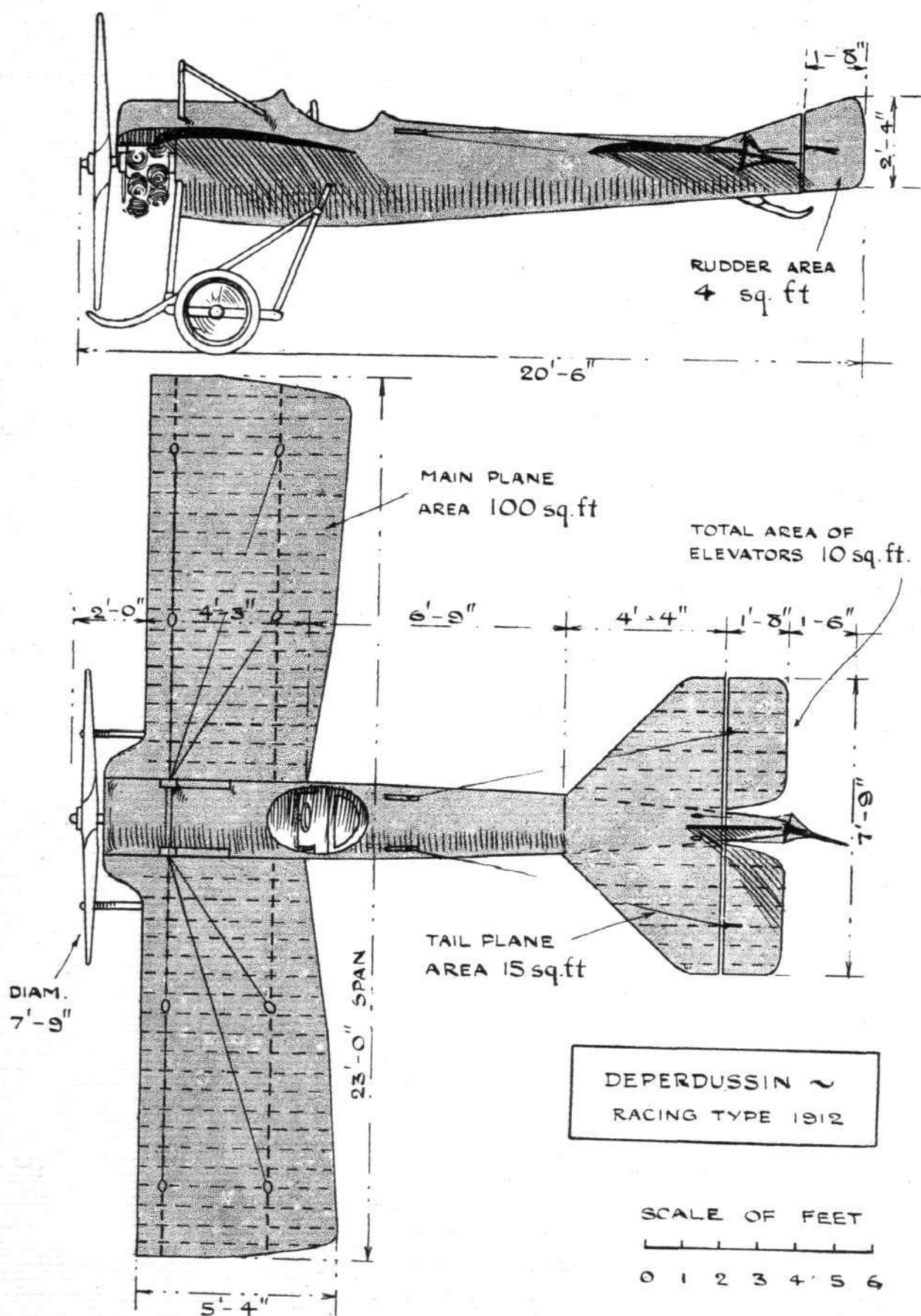
One thing is certain, that is, that it is possible to get a much more powerful warp than if the wings tapered in the opposite sense. As a further advantage it is claimed that the span may be reduced without interfering with its flying qualities. In cross section the wings exhibit a very slight camber, and this, combined with the fact that they are set at an angle of only five degrees incident to the relative wind no doubt chiefly accounts for the remarkable speed



The 100-h.p. Deperdussin racing monoplane viewed from above, showing the pronounced butterfly-shape of the wings. Vedrines is seen seated in the cockpit, and to his right is M. Béchereau, chief engineer of the Deperdussin firm, to whom the design of this machine is due.



The 100-h.p. Gnome-engined racing Deperdussin monoplane, as seen from behind. In the pilot's seat is Vedrines, who, flying this machine, beat the existing world's speed records up to 150 kiloms. at Pau on January 13th, 1912.



THE 100-H.P. RACING DEPERDUSSIN MONOPLANE.—Plan and elevation to scale.

this machine has shown. The trailing edge is of flexible construction so that any temporary increase of pressure beneath one wing may be automatically released. Hickory is employed for the spars, and the ribs are of I section, constructed from pine and ash. These same materials are used to form the framework of the stabilizing surface at the rear, and in both cases three-ply wood is made use of to form the leading edge. The fabric covering of the wings is treated, as is customary in the Deperdussin workshops, by several successive coatings of special varnish which renders it impervious to water, oil and petrol. Stranded steel cables are provided to take the weight of the machine in flight.

Despite the amount of criticism that was applied to the Deperdussin-type of landing gear at the time of its first appearance at the Paris Aero Show over a year ago, and has been applied at occasional intervals since then, this section of the machine has not, even in this latest model, where landing is effected at speeds in the neighbourhood of 90 miles an hour, undergone the slightest change. This, in our opinion, is sufficient evidence of the soundness of its design. Quite novel is the fitting of the rear skid. Only that part which rubs on the ground emerges from the fuselage, the remainder, together with the elastic cord attachment which endows this organ with flexibility, is disposed in its interior, a feature making for lessened head

resistance and cleanness of design. The tail has been particularly low built in relation to the front part of the machine, in order that it may leave the ground more quickly, and pull up in a shorter time on landing.

As regards the tail, the arrangement of this organ is essentially the same as on the firm's less speedy machines, excepting that the surfaces are applied without the use of bracing wires or strainers. The controlling arrangements are absolutely identical with those on the standard types of this firm's productions—a wheel mounted vertically at the centre of an inverted U-shaped sweep of wood being pulled towards and pushed away from the pilot to effect elevation and depression, while rotating it laterally actuates the warping. One difference is evident, however, that the control is, in this machine, totally enclosed in the fuselage. The rudder is operated from a pivoted foot-bar.

Tractive force is derived from a 14-cylinder 100-h.p. Gnome engine direct coupled to a rapid propeller of 8 ft. 3 ins. in diameter. The main support of the engine is at the rear, but there is also a subsidiary support in front composed of three steel tubes arranged Y fashion. A thin shield of aluminium covering the motor effectively prevents any oil from being thrown in the direction of the pilot.

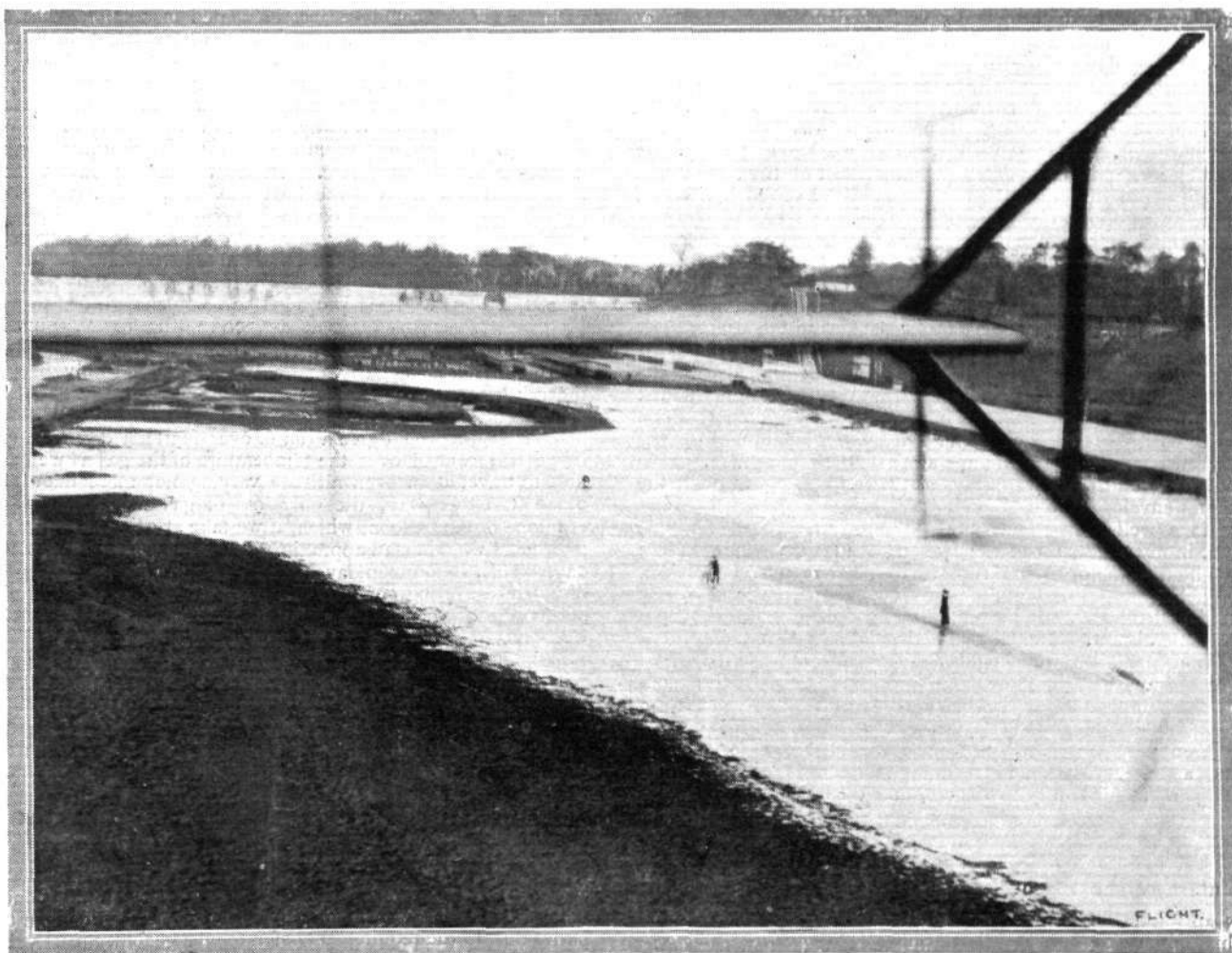


The Prince Henry Cup.

THE cup which Prince Henry of Prussia has offered in connection with the Upper Rhine cross-country competition from May 12th-25th, will only be open to military aviators, and amateurs and manufacturer's pilots are ineligible. Each competitor must be followed in his flight by a motor car carrying an official observer and the necessary tools and spare parts. In the case of repairs only one mechanic may assist the pilot. The organisers will indemnify the makers of the competing machines at the rate of 1,000 marks per machine per stage. The flights will be followed by three dirigibles carrying official observers.

The Austrian Aeronautical Exhibition.

THE International Flight Exhibition at Vienna, which is being organised by the Austrian Technical Flying Society, assisted by the Austrian Government, under the patronage of the Emperor of Austria, promises to be very successful. It will be held during the four weeks from May 18th to June 23rd, and exhibits will be divided into seven classes, embracing an historical section and sections for free balloons and airships, gliders and aeroplanes (including kites), aero-motors, special apparatus (including machine tools, &c.) and models. Full particulars can be obtained from Vienna 1, Aspernplatz, Urania-gebäude.



A view of Brooklands during the skating spell which has been in force recently, showing the flooded meadows reaching right up to the paddock sheds. This picture was taken from Pizey's Bristol biplane last week.

REVIVAL OF BALLOONING.

By A. E. GAUDRON.

THE year 1911 has proved a record year for balloon ascents in France. At the Paris Aero Club ground, St. Cloud, all previous records have been beaten in the number of ascents made during 1911, which reached a total of 412. This does not include ascents made by other clubs and by private persons in other parts of France, and we may conjecture that nearly 1,000 ascents in all have taken place. This revival we may partly attribute to the aviation boom, as many recruits to aviation have also embraced aerostation; and in one notable instance a well-known aviator, Emile Dubonnet, recently beat the record for long-distance balloon voyage held by Count de la Vaulx for the past eleven years. This record was beaten on January 7th of this year, when Emile Dubonnet travelled from Motte-Breuil, near Paris, to Sokolowska, in the province of Kieff, Russia, covering a distance of 1,233 miles, or 40 miles more than that of Count de la Vaulx's journey in 1900. The greatest distance accomplished by balloon from this country is 1,117 miles, when, in 1908, I had the pleasure of bringing this record to England by piloting a balloon from London to Russia.

The time has surely come to revive the sport of aeronautics in England. We should not be left behind, but use every endeavour to bring the world's record to this country. The spherical balloon of the present day is not so very greatly changed since its introduction in 1783, although it appears to me there is no reason why it should not be altered and improved upon. One has only to turn to the dirigible to see how it differs from the ordinary balloon in construction, and after all the dirigible is an aerostat. It possesses no netting to cover it, it is entirely closed by automatic valves, and the whole weight of its gear, amounting in some cases to tons, is entirely suspended from the envelope containing the gas with which it is inflated. This method of suspension does not, of course, include the Zeppelin-type of dirigible, but I see that the German military authorities have now discarded the rigid for the non-rigid type.

It was only a matter of time to arrive at this conclusion, as the rigid type of airship was always looked upon by experts as impractical. There is a great field opening for aerostation in the future. Day by day we see hydrogen gas coming more into use, and in a few years hydrogen will be as cheap as coal gas is to-day. Coal gas is deteriorating in quality for aerostation owing to the introduction of carburated water gas making its way for lighting and cooking purposes. Hydrogen will raise, as we know, 70 lbs. per 1,000 (cubic) ft. and coal gas 40 lbs., but as most of the large towns now produce a mixture of coal gas and carburated water gas, the lift cannot be relied upon to be more than 30 lbs. per 1,000 (cubic) ft., so that we may welcome the introduction of hydrogen on the market, which will undoubtedly open up a new field for the balloon, but it is not only in this direction the aeronaut has to look. A new and improved aerostat itself will shortly be created. The present balloon is very much at the mercy of the various changes in the atmosphere, and its power of remaining in the air very much depends on the amount of ballast the aeronaut has at his disposal, and also to the extent of the variation of temperature during the twenty-four hours. This variation acts on the gas, and in the case of an ordinary balloon filled with coal gas it has been found that the temperature of the gas was 26° centigrade above the temperature of the atmosphere. This was partly caused by the warm rays of the sun passing through the transparent envelope of the balloon.

This is a well-known fact, as I myself can certify. On one occasion, in my youth, I had a new varnished silk balloon partly filled with air in the open, and through the heat of a powerful sun, and the help of a gust of wind, it escaped and rose to a considerable height, travelled away, and landed on the roof of a six-storey house nearly a mile distant. The balloon had acted as a Montgolfier.

I do not see why we should not put our minds to remedy this great drawback in aerostation, and find a means of controlling the temperature of the gas and travel at a more uniform and constant altitude, and if we can accomplish this, there is no reason why we should not remain in the air for several days at a time. The present duration record for a balloon remaining in the air is fifty-two hours, and this record was attained

only through having a very even temperature during the journey. If the temperature of the gas rises in the envelope of a balloon, the balloon rises to a great altitude, and to prevent bursting through expansion of the gas, one has to allow it to escape through the neck, which is left open for that purpose. It first occurred to Pilate de Rozier, in 1785, to attempt to control the temperature of the gas in a balloon, but unfortunately the ascent he made as an experiment ended fatally, not, as is generally believed, by the system of his aero-Montgolfier, but by the tearing of the gas balloon, which was no doubt rather worn and probably burnt by sulphuric acid from his somewhat impure hydrogen, which settles in vapour round the valve, and when he put an extra pressure by pulling the valve line, the balloon ripped. This version is partly confirmed by a description given by M. de Maissonfort, who was on the spot where the balloon landed at the time; and he states, in an article describing the event, that the balloon bore no mark of having been burnt by fire, and that the furnace had never been lighted. Since that day no one has had the courage to emulate the idea of Pilate de Rozier; but times have changed. We have many improvements in our favour, and there is no reason why we should not go forward in this direction and open up a new future for aerostation. I have a scheme in my mind for a new aerostat, which I will call an aero Montgolfier, and will here endeavour to explain briefly the outline of it.

The aero Montgolfier, with a capacity of 120,000 cubic ft. when inflated with hydrogen gas, will raise 8,500 lbs., of which over 5,000 lbs. can be regarded as ballast. The air ballonet has a capacity of 42,000 cubic ft., which, when inflated with hot air will raise an extra 600 or 700 lbs. The balloon would be constructed with the strongest material obtainable and the least porous for hydrogen. The gas balloon would be completely closed by an automatic hydraulic valve which outlet would be situated so that no gas would be near the heat generator. The whole balloon would be rendered moisture and rain proof by a smooth surface aluminised. The car arrangement would consist of a large platform where eight passengers could be accommodated in comfort, with a lower car for provisions, ballast and fuel which could be used as a sleeping compartment for four passengers at a time. The Calorique is a very ingenious heat producer, entirely enclosed in an aluminium funnel, and its aperture is completely surrounded with gauze wire. The gas balloon is 40 ft. away, whilst the only valve or gas outlet is nearly 80 ft. away, and when the Calorique is working there is no discharge of gas anywhere. Inside the air ballonet there is no outlet of gas whatever—the heat producer, which can be worked at will—generates from 5,000 to 500,000 calories per hour, whilst the flame, which is entirely encased, will not be bigger than 14 ins. diameter by 18 ins. high at its greatest power. The fuel to work it is liquid in the shape of heavy oil, not inflammable, only when turned into gas. It is proposed to carry enough fuel to work the Calorique for seventy hours at 500,000 calories or six hundred and fifty hours at 5,000 calories, and as the Calorique will only be in use at most fifteen hours daily, and at all times would only be required to work barely at its medium power, the fuel would last for over two hundred and fifty hours, and as we should only want it for fifteen hours a day, it would give a run of over fourteen days. Therefore, if we had control over the temperature of the gas as well as being able to travel at an even altitude varying not more than 1,000 to 2,000 ft. either way, the only loss of gas would be through the envelope of the balloon, which, if we take at 2½ per cent. in twenty-four hours would mean approximately, less than 3,000 cubic ft. per day. This, in fourteen days would be 42,000 cubic feet—or a loss of 2,940 lbs. lifting power, which would be represented by the use of 2,000 lbs. of fuel and the remainder as ordinary ballast. Such a balloon is able to carry in all 5,000 lbs. of ballast, and the lift of the Montgolfier would be an extra 700 lbs. At all times the balloon is practically a full balloon. This will show at a glance the possibilities of the system, and I am confident that it will not be long before it will be an accomplished fact. These are the primary outlines of the system, but I propose to publish further and fuller details of interest concerning the working arrangement during a journey with such an aerostat.



The Future of the Flight Industry.

IN an interesting article under the above title, Dr. E. Valentin gives his impressions of the Paris Show (*Allgemeine Automobil Zeitung*, Berlin Edition, January 12th), and traces the analogy between the development stages of the aeroplane and the motor car, pointing out how in both instances the motor has wandered about the

chassis until it has found a definite resting-place in the front part; how wood is disappearing from the plane as it did from the car, partly due to the requirements of interchangeability, partly because of the survival of the fittest; how, again, in both cases, the unprotected position of both engine and driver has given way to the enclosure of both with bonnet and car-like seats respectively.

DISCUSSION ON SOARING FLIGHT AT THE AERONAUTICAL SOCIETY.

DR. E. H. HANKIN :—

Looked at from the broadest standpoint, there are only two possible theories of soaring flight. One that we are dealing with a manifestation of kinetic energy, the other that we are dealing with a manifestation of potential energy.

The fact that air, in some cases, conducts sound unusually well when it has become unsoarable after a storm, is a fact that obviously supports the idea that we are dealing with kinetic energy. Why has this fact not been quoted by opponents of ergaer?

The fact that the soaring of hill crows only occurs in the absence of wind puts out of court much of the references to the influence of wind that occur so frequently in the ideal soarability of theorists. Admitting that a feather might drop through the air in a wind having an upward component of 2 or 3 ft. a second, the kind of soaring flight that would be thereby explained is of the ideal variety having little relation to actual facts. The bent-up position of the wing-tip feathers in fast flex-gliding could certainly not be explained by an upward component unless this amounted to a speed of some thirty miles an hour. Therefore, if soaring flight is due to kinetic energy, the movement must be of a kind that has nothing to do with wind, that has no visible effect on small cloud masses and leaves a piece of thistle down apparently unaffected.

In the change from slow to fast flex-gliding, two different adjustments may be used. If the adjustment is an increase of flexing, the increase of speed goes on during several seconds. If there is also a double dip the increase of speed may be as much as ten metres per second, and this increase appears to occur almost momentarily. During the double dip there is a transverse axis rotation. But a dive downwards, such as would be necessary to explain the increase of speed on the kinetic energy theory does not occur. Apparently the double dip causes an increased air disturbance that initiates the increased rate of decomposition of ergaer as must occur in fast flex-gliding. There are reasons for believing that lateral instability is due to irregular distribution of ergaer, and that transverse axis instability is due to variations in the quality of ergaer, that is to say of its liability to decompose. The kinetic theory cannot explain the observed facts connected with this latter form of instability.

At the time of the approach of the monsoon season of 1911, I occasionally observed local and temporary soarability that occurred an hour or more before the time of development of sun soarability. I noticed firstly that this local instability only existed in and during a puff of wind, and secondly that, especially at its commencement, it was characterised by a great degree of transverse axis instability. I regard this as a proof that in the puff of wind ergaer was changing from a stable condition in which it was unavailable for soaring flight to a condition in which it was available, and perhaps also that it was completely decomposing, thus causing the wind-puff. One of the differences between "sun soarability" and "wind soarability" is that sun soarability usually commences over the houses of the city of Agra a few minutes before it commences over the trees and gardens of Agra Cantonment. Wind soarability, on the other hand, commences anywhere, and only in the presence of wind. "Disturbed weather" and "storm soarability" are only special cases of "wind soarability."

When a dust storm has developed, two winds exist; firstly, the "attraction wind," which blows from all quarters towards the storm, and, secondly, the "displacement wind." The attraction wind blows with an upward trend, and on nearing the storm forms an upward current. In the centre of this upward current a descending current was formed. This, when it reached the earth, spreads out in all directions, but especially to leeward, forming the "displacement wind." Apparently, the same air goes up in the attraction wind, turns round and comes down again in the displacement wind.

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10,000 FRANCS FOR A HUMAN FLIGHT.

UNDER the title of "Le Prix Peugeot," a prize of 10,000 frs. has been offered in France for the first flight of at least 10 metres (32·8 ft.) made by a man, by his own muscular energy, over a level ground. No restrictions are placed upon the apparatus to be used, but no assistants will be permitted to competitors either at the launching from the ground or during the period the man is in the air.

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Fatal Accident at Versailles.

OVER confidence it seems was the real cause of the death of Captain Le Maguet, a pupil at the St. Cyr flying school, who met with an accident on Saturday last, from the results of which he died on the following morning. After a fortnight's tuition he felt bold enough to rise to a height of 100 metres and made several very good

The attraction wind, despite the upward trend, lost soarability as it approached the storm, at any rate in the absence of sunshine. The displacement wind, despite its downward trend, was usually highly soarable, and birds in this wind not infrequently showed very great instability, especially instability round the transverse axis. If my views of the nature of a dust storm are correct, we have a case in which soarability decreases and then increases in the same air, a fact very difficult to reconcile with the kinetic energy theory.

It has been suggested that the turned-up position of the wing tip feathers in fast flex-gliding might be due to the known lifting action of a horizontal current of air on a convex surface having the convexity upwards. Unfortunately for this suggestion, the ends of the feathers are so far lifted up that their convexity is below, as shown in Fig. 74 in my "Study of Bird Flight." Thus in this case again, the ideal soaring flight that is explained by the kinetic energy theory differs from the real soaring flight that cannot be so explained.

The question has been asked why, if ergaer explodes on the under side of the wing lifting the bird, why does it not also explode on the upper side of the wing driving the bird downwards? In the first place I may point out that the answer to this question does not bear directly on the question now before us, namely, whether the conception of ergaer is one that is true or probable. There are only two possibilities. Soarability is due either to kinetic or potential energy. If the kinetic energy theory is knocked to pieces, only the potential energy theory remains. I have, as I think, done more in that I have given reason for believing that energy is stored in the air. As to how this energy is stored, and as to how it can become available, we must look to future research for an answer. It is a fact that the air under the wing is more compressed than the air over the wing, and that explosive gases are more readily exploded when compressed. But whether or not this has a bearing on the question propounded must be a matter for future research.

MR. JOSE WEISS :—

From occasional extraordinary results from my glider I have come to the conclusion that the difference between gliding and soaring is only a matter of degree, not of principle. I feel that most people, through insufficient investigation, fail to realise how slight a gliding angle may be made, therefore they seek in far-fetched theories the explanation of results that are due only to very great efficiency. The misconception is not as to the fact that the bird obtains energy from the air, but as to the amount that it requires in order to maintain its soaring flight.

The glider and the soaring bird are both falling bodies following the paths of least resistance. A glider having an infinitely small drift, must follow a path very nearly horizontal once it has acquired its natural velocity. A bird approximates very closely to a theoretical glider of this kind, and the energy required to change gliding into soaring is so small that I see no difficulty in accounting for it on the theory of wind. The least undulation in the atmosphere would be quite sufficient, and it is not surprising that soaring birds abound in more tropical climates where the sun, which is the principal agency giving rise to suitable movements of the atmosphere, is so much in evidence. It seems to me that the phenomenon of soaring emphasises the necessity of investigating in the minutest possible detail the causes of high efficiency in bird flight, such as the motion of the air in the vicinity of the wing, and the nature of the disturbance set up by the passage of the bird through the atmosphere.

It might be possible to verify the gliding angle of birds by borrowing a few species from the Zoo and letting them fly about in a large empty hall. This would eliminate wind, and I believe that careful observation would enable a fairly accurate estimate of the gliding angle to be obtained.

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The course will be marked out by two parallel lines, and during the flight no part of the apparatus must touch the ground between the two lines. In order that the prize may not be claimed by anyone simply taking advantage of the wind, each competitor will be required to make two flights, following each other, one in each direction. The competition will open on June 1st, and the prize will be awarded to the first man who complies with the rules.

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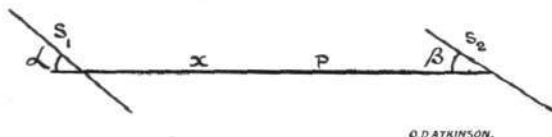
turns at that height. The last one was, however, made much too sharply, with the result that the machine side-slipped and crashed to the ground from a height of 60 metres. Assistance was at hand almost instantaneously but on extricating the pilot from the wreckage it was seen that his injuries were very serious and included a fractured skull and fractures to an arm and a thigh.

LONGITUDINAL STABILITY.

By O. D. ATKINSON.

MR. MERVYN O'GORMAN, in the paper which he read before the Incorporated Institution of Automobile Engineers last year, touched on the problem of longitudinal stability at some length, but although he showed some interesting graphs, he did not give the mathematical proofs of his statements. It is the purpose of this article to give these latter. Mr. O'Gorman's conclusions on this subject were two in number, namely, that for longitudinal stability the angle of incidence of the front plane must be greater than that of the rear, and that the so-called "tail-first" type is more stable than the other two types, namely, the Farman and the Blériot.

Let us imagine an aeroplane, the surfaces of the front and back planes being S_1 , S_2 respectively, and their angles of incidence α , β .



O. D. ATKINSON.

Let the distance between their two centres of pressure be x , and let P be the resultant centre of pressure.

The longitudinal stability of this aeroplane owes its existence to a great extent to a righting couple, whose moment varies as the travel of P . Let the aeroplane be tilted up through an angle θ , and let us take the first case, when $\alpha = \beta$.

Then, before tilting, P divides x in the ratio of $\frac{KS_1 V^2 \sin \alpha}{KS_2 V^2 \sin \beta} = \frac{S_1}{S_2}$, the formula for the total resistance, not the lift, being employed.

After tilting, P divides x in the ratio of $\frac{KS_1 V^2 \sin(\alpha + \theta)}{KS_2 V^2 \sin(\beta + \theta)} = \frac{S_1}{S_2}$.

$\therefore P$ does not travel, and the aeroplane is in neutral equilibrium. Let us then take the case where $\beta > \alpha$.

In normal flight, P again divides x in the ratio of $\frac{S_1 \sin \alpha}{S_2 \sin \beta}$. When the machine is tilted through θ this becomes $\frac{S_1 \sin(\alpha + \theta)}{S_2 \sin(\beta + \theta)}$, and

P travels forwards or backwards, according as to whether $\frac{S_1 \sin(\alpha + \theta)}{S_2 \sin(\beta + \theta)}$ is greater or less than $\frac{S_1 \sin \alpha}{S_2 \sin \beta}$.

But since $\beta > \alpha$, $\cos(\beta - \alpha - \theta) > \cos(\alpha - \beta - \theta)$, $\therefore \cos(\beta - \alpha - \theta) - \cos(\alpha + \beta + \theta) > \cos(\alpha - \beta - \theta) - \cos(\alpha + \beta + \theta)$,

$\therefore \sin \beta \sin(\alpha + \theta) > \sin \alpha \sin(\beta + \theta)$, $\therefore \frac{\sin(\alpha + \theta)}{\sin(\beta + \theta)} > \frac{\sin \alpha}{\sin \beta}$.

$\therefore P$ travels forward and the aeroplane is in unstable equilibrium. If, however, $\alpha > \beta$, the reverse of this occurs, and stable equilibrium is obtained. By tilting the aeroplane down instead of

up, we get similar results to those above. All through this article the travel of the centre of pressure on each plane due to the increase of the angle of incidence has been neglected, as this is very small compared with the total travel.

Mr. O'Gorman's next point was the relative sizes of the front and tail plane.

Let $KS_2 = S_1$, and let the travel of the centre of pressure be z .

Then $z = x \left\{ \frac{KS_2 \sin \alpha}{KS_2 \sin \alpha + S_2 \sin \beta} - \frac{KS_2 \sin(\alpha + \theta)}{KS_2 \sin(\alpha + \theta) + S_2 \sin(\beta + \theta)} \right\}$.

Let $\sin \alpha$, $\sin \beta$, $\sin(\alpha + \theta)$, $\sin(\beta + \theta)$, and $\frac{z}{x}$ equal a , b , c , d , y , respectively.

Then $y = \frac{aK}{aK + b} - \frac{cK}{cK + d} = \frac{K(ad - bc)}{acK^2 + K(ad + bc) + bd}$.

Let this = $\frac{AK}{BK^2 + CK + D}$.

Then $\frac{dy}{dK} = \frac{A(BK^2 + CK + D) - AK(2BK + C)}{(BK^2 + CK + D)^2} = \frac{AD - ABK^2}{(BK^2 + CK + D)^2}$.

When $\frac{dy}{dK} = 0$, $K = \sqrt{\frac{D}{B}}$ or $\frac{\pm \sqrt{C^2 - 4BD - 2BC}}{2B}$, the former

gives the maximum positive value of y .

$\therefore K = \sqrt{\frac{bd}{ac}} = \sqrt{\frac{\sin \beta \sin(\beta + \theta)}{\sin \alpha \sin(\alpha + \theta)}}$, and $\sin \alpha > \sin \beta$.

$\therefore K$ is a fraction, and S_1 is smaller in magnitude than S_2 . When the tilt is downwards, K , by similar working, becomes equal to

$$\sqrt{\frac{\sin \beta \sin(\beta - \theta)}{\sin \alpha \sin(\alpha - \theta)}}$$

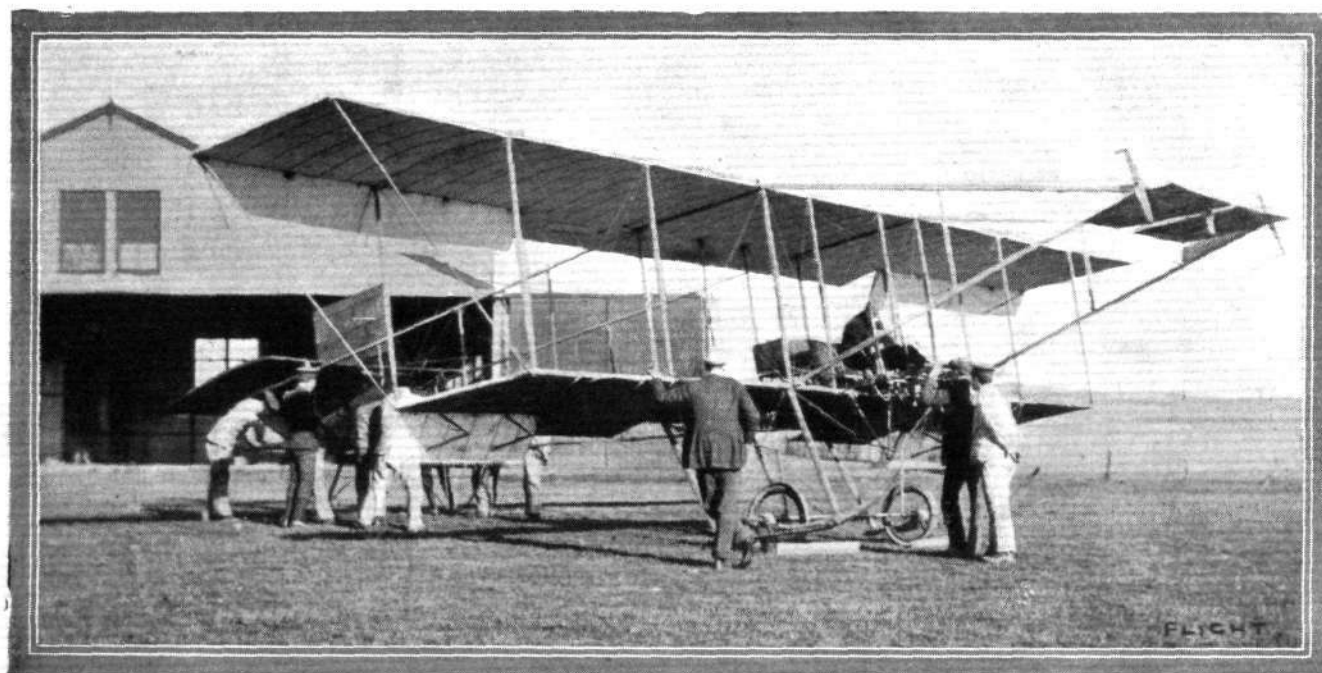
If we add a front elevator to a Blériot type we have a Farman type. In practice the angle of incidence of the elevator is generally 0° in normal flight, and it is easy to see, without wading through more heavy working, that as the tilt increases, the elevator exerts a lift bringing the centre of pressure forward, and *vice versa*, thus decreasing the stability of the machine. If a flat tail plane is put on to a "tail-first" type, however, exactly the opposite occurs, and the stability is increased.

At first sight it may seem that the value of K has solved the problem of stability, but a more careful reading will betray that it contains θ , a variable; still, if it does nothing else, it serves to show the superior inherent stability of the "tail-first" aeroplane to the other two types.



University College Lectures.

AN introductory lecture on the theory of the aeroplane was given on February 2nd at the University College, Gower Street, by Mr. A. R. Low, who will begin a series of class lectures on February 9th. When these are completed, the College will hold an examination and issue certificates.



Territorials at the Royal Aero Club's Eastchurch flying grounds practising with "Short" biplane, No. 32.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Annual General Meeting.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

Notices of motion for the Annual General Meeting must be received by the Secretary not less than twenty-one days before the meeting, and must be signed by at least five members. Thursday, February 29th, 1912, is the last day for the receipt of notices of motion.

Committee.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the Committee are :—

| | |
|-------------------------------|-----------------------------|
| Ernest C. Bucknall. | Sir Charles D. Rose, Bart., |
| Col. J. E. Capper, C.B., R.E. | M.P. |
| G. B. Cockburn. | A. Mortimer Singer. |
| E. Manville. | Hon. A. Stanley, M.P. |
| J. T. C. Moore-Brabazon. | R. W. Wallace, K.C. |

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary in writing not less than fourteen days before the Annual General Meeting. Thursday, March 7th, is the last day for the receipt of nominations.

Members are reminded that a ballot paper for the election of nine candidates to seats on the Committee of the Club will be forwarded to them at least seven days before the date of the Annual General Meeting.

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 6th inst., when there were present :—Mr. R. W. Wallace, K.C., in the Chair, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Prof. A. K. Huntington, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, Mr. A. Mortimer Singer, and G. F. Joseph, Assistant Secretary.

New Members.—The following new members were elected :—Damer Leslie Allen, Henry Bedford Hemmons, Cyril Wright Meredith, Lionel Seymour Metford, Harold Gustav Meyer, M.A., L.L.B., and Gerald Meyrick Part.

Aviators' Certificates.—The following Aviators' Certificates were granted :—

179. Frederick Warren Merriam (Bristol Biplane, Brooklands).
180. William Bendall (Bristol Biplane, Salisbury).

Balloon Prizes.

The Hon. Mrs. Assheton Harbord has very kindly offered a cup or the first balloon to descend in Scotland, this year, the start to be made within ten miles of London.

Mr. A. Mortimer Singer has very kindly offered a cup for the first balloon to descend in Ireland, this year, the start to be made within ten miles of London.

The full conditions of the two prizes will be announced later.

Army and Navy Aviation Prizes.

(Presented by Mr. A. Mortimer Singer.)

Army ... £500 Navy and Marines ... £500
Intending competitors are again reminded that this competition will close on March 31st, 1912.

Entries have so far been received from the following :—

Entrant.

| | |
|------------------------|----------------------------------|
| Capt. C. R. W. Allen | ... Infantry. |
| Capt. G. W. Dawes | ... Infantry. |
| Capt. J. D. B. Fulton | ... Royal Artillery. |
| Capt. E. L. Gerrard | ... Royal Marine Light Infantry. |
| Lieut. R. Gregory | ... Royal Navy. |
| Lieut. G. B. Hynes | ... Royal Garrison Artillery. |
| Lieut. A. M. Longmore | ... Royal Navy. |
| Capt. E. B. Loraine | ... Grenadier Guards. |
| Lieut. W. Parke | ... Royal Navy. |
| Commander C. R. Samson | ... Royal Navy. |

Branch of Service.

The following are the performances so far recorded :—

Army.—July 17th, 1911. Late Lieut. R. A. Cammell, with passenger. Blériot monoplane, 70-h.p. Gnome motor. Distance 100 miles.

January 29th, 1912. Lieut. B. H. Barrington-Kennett, with passenger. Nieuport monoplane, 50-h.p. Gnome motor. Distance 111 miles.

Navy and Marines.—August 16th, 1911. Capt. E. L. Gerrard, R.M.L.I., with passenger. Short biplane, 50-h.p. Gnome motor. Distance 129 miles.

These are approximate distances, and will be subject, if necessary, to verification.

British Empire Michelin Cup No. 1.

The rules for the British Empire Michelin Cup No. 1 have now been drafted, and it is hoped that these will be published in next week's notices.

British Empire Michelin Cup No. 2, £600.

The contest for the current year consists of a cross-country circuit of about 186 miles. Competitors may choose their own course, which must be previously approved by the club. The competition is now open, and the rules and entry form can be obtained from the Royal Aero Club.

Austrian International Aero Exhibition.

An International Aero Exhibition, organised by the k.k. Oesterreichischen Flugtechnischen Verein, will take place in Vienna from May 18th to June 23rd, 1912. Full particulars, together with application forms for space, can be obtained from the Secretary, Royal Aero Club, 166, Piccadilly, W.

Gordon-Bennett Aviation Cup.

The cup having been won by a representative of the Aero Club of America, the race for 1912 will take place in the United States. The exact time and place will be announced later.

At the recent Conference of the Fédération Aéronautique Internationale in Rome, it was decided that the course is to be a closed circuit with a minimum of 5 kilometres, and the total distance to be flown is 200 kilometres.

Each club affiliated to the Fédération Aéronautique Internationale has the right to challenge the holder, the Aero Club of America, and such challenge must be sent in before March 1st, 1912.

The Committee of the Royal Aero Club will select the three competitors to represent the British Empire, and intending candidates are requested to notify the Secretary on or before February 15th, 1912, of their willingness to compete, if chosen. Applications must be accompanied by a cheque for £20, the entry fee, which amount will be returned should the entrant not be selected.

Aviation Lantern Slides.

The Royal Aero Club has acquired a large collection of lantern slides dealing with aviation, and members can hire these at a nominal fee.

In order to make the Club collection more complete, the Committee will be glad to receive gifts of slides, and negatives or photographs from which slides can be made.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

ROYAL AERO CLUB FLYING GROUND, EASTCHURCH.

THE weather during the early part of last week was fairly good, with moderate winds blowing, and several naval officers were out practising. Engineer Lieut. Randell, R.N., one of the last batch of naval pupils, is making very good progress in flying, and on Wednesday remained in the air for about 30 mins. on the Short No. 38 biplane, afterwards landing in an excellent manner. He is

now quite proficient in turning and banking, and only a spell of bad weather setting in prevented him from taking his pilot's certificate this week.

During the latter part of the week flying here has been rendered almost impossible by frequent falls of snow, accompanied by strong winds.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Flying Ground, Eastchurch.

THE report for the week follows the official notices on page 125.

Barrhead Aerodrome (Scottish Aviation Co., Ltd.).

SINCE the accident to the Blériot, when the cylinder was blown off, the machine has been undergoing a complete overhaul, and now a 35-h.p. J.A.P. has been fitted in place of the previous engine.

On Saturday last, after testing the engine, Mr. Philpott (the pilot to the firm) took the Blériot out, and after making one or two short flights, was so satisfied with the behaviour of the machine that he continued to fly it the remainder of the afternoon. On Thursday, Mr. H. O. Walsh, a new pupil, had the Blériot out for rolling practice. On Saturday, Mrs. Lucking (who has been away on holidays) again joined the school, and got in some useful rolling practice. Mr. Norman, who is the managing-director of the Company, and Mr. Walsh then did some rolling, Walsh showing great improvement, he making excellent straight rolls with the tail well up.

Brighton-Shoreham Aerodrome.

WEDNESDAY of last week saw Lieut. Walter Lawrence following up his previous performances in right good form. During the morning he was flying circuits in the neighbourhood of the aerodrome, on one occasion going a mile out to sea, and mounting to a height of close on 2,000 ft. In the afternoon he made two flights in splendid style, showing a masterly touch in both mounting and coming to earth. On Saturday afternoon things were not so favourable, for his attempt to fly to Eastbourne was frustrated ere he had left this ground. It appears that the Gnome, which had been pulling well, lost its power somewhat on getting away, and the machine, which failed to lift sufficiently, heeled over when about 12 ft. up, side-slipped, and damaged one wing, part of chassis, and tail. Lieut. Lawrence and his companion, De Villiers, a Chanter pupil, were both unhurt.

England and Dowland both put in short flights on the Collyer-England machine. They have decided to fit a new propeller.

On Wednesday, the 31st ult., Chanter and Swann were doing "stunts" on the Anzani-Blériot, and on Tuesday of this week the new Chanter machine was tested after the alterations she had been undergoing. She listed much more easily and made a fine flight, showing a remarkable turn of speed; altogether a great improvement over her last trials.



Mr. Alec Ogilvie flying his N.E.C.-engined Wright biplane at the Royal Aero Club's Eastchurch grounds last week.

Brooklands Aerodrome.

ON Wednesday last week Percival was out, first by himself then with passengers. Gilmour returned from Hendon on the Martin Handasyde, finding it gusty and very cold on the voyage. Pizey was in the air on the Bristol giving instruction to Lieut. Carfrae, while Merriam, Weeding, and Nesham flew circuits. Later, Smith made some straight flights, and Pizey made two circuits with Lane. Ducrocq tested a new Oerlikon engine, which he has placed in his Farman instead of a Gnome, but as it was missing occasionally he only indulged in straight flights.

On Thursday, Percival was flying strongly over the golf links on his biplane. His engine has been fitted with a Sv. carburettor, which seems to suit it better than the original one. On his return, Miss Percival and a pupil put in some rolling, the latter turning the machine on to one wing-tip, but doing no damage. Johnstone and Knight made some straight flights on the Vickers, the machine seeming to be easy to land, owing to the facility with which she can be made to pancake. Beatty was out in the afternoon indulging in lines and curves, his handling of the machine showing great improvement, especially in his landings.

On Friday, Johnstone, Knight and Captain Sykes flew straights on the Vickers No. 2, which has been fitted with the Vickers engine from No. 3 machine, replacing the French R.E.P. Pizey was up on the Bristol with Carfrae for landing practice, while Weeding made solo flights and Smith right-hand turns. Merriam practised landing to a mark with some success on the Bristol, and Pizey took up Carfrae, Nesham and Smith as passengers. Then Merriam passed the tests for his *brevet*, flying well and landing perfectly. Pizey later ascended with a press photographer for the purpose of taking photographs of the skaters on the floods near the paddock.

On Saturday, Johnstone made his first circuit on the Vickers school machine, at about 200 ft. When over the sewage farm, his engine failed, but fortunately he was able to glide down on to proper landing ground. He was followed by Capt. Sykes for about an hour with straights, Capt. Wood putting in about 10 minutes afterwards. The Bristol school was also at work, Pizey taking up Carfrae, while Raleigh, Weeding, and Smith made solo flights. Lieut. Murray, who has just taken his ticket at Salisbury, made two flights. Pizey then took up Lieut. Fielding as passenger. In the afternoon Pizey was up again with some passengers, finding it very gusty. Fleming then took Carfrae in for instruction, while Nesham made one circuit. Kemp put in a half-circuit on the Flanders, but also found the wind treacherous. Percival was also out during the afternoon. Gilmour made some fine flights on the Martin-Handasyde, on one occasion taking Charteris as passenger. Sopwith intended to take his Burgess-Wright machine out, but unfortunately a screw-driver was left on one plane and got "mixed up" with the engine on starting, to the detriment of the latter.

Too bad a wind prevailed during the whole of Sunday for any flying to take place, and Monday was little better.

On Tuesday, Petre made his first flight on the Deperdussin, going over the railway. He has picked up the knack of wheel-warping, which form of control he has not used previously, but is not yet quite sure of himself on his new mount. This, however, will probably come in a day or so. Weeding, on the Bristol, made some straight flights, but experienced some nasty *remout*, which he put down to the patches of melting snow on the ground. In the afternoon he performed the necessary figures of 8 for his *brevet*, but did not accomplish sufficient altitude; in fact, he flew very low the whole time. Kemp, on the Flanders, made a circuit after some straight flights, but came down complaining of too much smoke from the engine. A very favourable impression was made by the Bristol monoplane which, piloted by Pizey, flew several circuits in excellent style. Fitted with a 30-h.p. Anzani engine, it shows great speed and climbing powers. Sopwith's Burgess-Wright made its first appearance in the air at Brooklands, performing 45 degree banks, switch-backs, and other forms of aerial gymnastics. Simultaneously MacDonal went out on the Vickers. Making machine climb very steeply, he steered over the sewage farm making much variety in the angle of the machine relative to the ground. On returning he came down steeply, then flattening machine out slightly to her normal gliding-angle, he hit the ground without dropping the tail further. The landing chassis in consequence was crumpled up, but the machine slid for some distance, luckily without turning over or even touching a wing.

Eastbourne Aerodrome.

IN spite of the cold weather a good deal of useful practice was put in during the week. On Saturday, Mr. Gassler, who has recently joined the school, was out on one of the Anzani-Blériots doing straight flights. Yates was also out on the Gnome, and flew steadily at about 300 ft. On Tuesday, Gassler was out again, and did his first turn; he handles the Anzani very well, and should soon be sufficiently advanced to try the Gnome.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Gates was out early on Wednesday last week rolling and making straights on Biplane No. 3, Lewis Turner doing straights on Biplane No. 2; afterwards taking out No. 3, which had been previously running badly, for test he found the engine in good order and running well, so vacated pilot's seat to Biard, who put in a good deal of practice at straight flights.

Next day resulted in a fine day for school work, and all pupils turned out, doing good work. Biard was out on Biplane No. 3 making straight flights, Turner on Biplane No. 2 making circuits, after which he took up Biard in the passenger seat, initiating him into the mysteries of turns. The machine was then taken over by Fowler, who made some good circuits and proved himself to be almost ready for first stage of *brevet*. Gates was also out doing fine steady straights. In the afternoon Turner again took out No. 2 machine, doing circuits, followed by Fowler who completed several circuits at a height of 200 ft. Gates also had out Biplane No. 3 and was hard at it perfecting his straight flights prior to commencing circuits. Biard followed him and managed a half circuit, flying well with his machine in perfect control.

Fowler, Gates, Lewis Turner, and Biard were early on the scene on Friday, all making circuits, and all showing great improvement. Lewis Turner, during the afternoon, was making circuits, and landing *en vol plané* for edification of pupils.

Pupils again put in good work on Saturday, Fowler profiting by the previous day's demonstration, and making fine circuits, and landing *en vol plané* in professional style. In the afternoon Lewis Turner took out Biplane No. 2 for a test flight, prior to turning same over to pupils, but, considering the wind rather too gusty for pleasant flying, landed and taxied back to the hangars, the school adjourning to the workshops for theoretical work.

A.S.L. Flying School.—The awful weather has checked all work recently.

On Thursday last week, however, Mr. Barber brought out the Viking biplane, and put up several very successful flights with a passenger on board. The machine flew splendidly in a good breeze, and most striking was the remarkably quick "get-off" and the rapid rate of ascent.

Wind and snow prevented any flying during the week-end.

Blériot School.—Messrs. Pothet and Clappen, on Monday last week, were out practising early, and both made several straight lines in very good style, during which time M. Deseutter made some even and regular circuits of the ground at a good height.

On Wednesday, Pothet and Clappen thought it was about time they attempted something more exciting than straight lines, and during the course of their practising got off the ground on several occasions, and made their initial flight in, of course, a straight line. Mr. Hall, a new pupil, took his first lesson on one of the school taxis and found little difficulty in making a pretty straight track across the ground. He looks like making rapid progress. Mr. Prenssiel was also out and made a brace of circuits in his usual steady style, landing comfortably with a nicely calculated *vol plané*.

Next day, taking advantage of a comparatively fine day, all the pupils put in a good spell of hard work. Messrs. Welburn, Pothet and Clappen, the latter two remembering their successes in actual flight on the preceding day, increased their flying distances, and Mr. Welburn actively followed their examples. Messrs. Prenssiel and Deseutter did some more circuits faultlessly, and it is exceedingly bad luck that these two, who are flying excellently well should, together with Messrs. Parr and Allen, be only held back by the weather from taking their tickets with ease. Mr. Hall, continuing his instruction, was making very good attempts at getting across in a perfectly straight line, and considering the short time he has been on the machine is doing quite well.

W. H. Ewen School.—Owing to the unfavourable weather during the past week, the pupils at the W. H. Ewen school have not been able to get in much flying practice. They, however, have not been wasting time, for by taking off their coats and assisting in the work of overhauling and building new parts they are gaining experience, without which a pilot is at a sad loss. On Tuesday, although the wind was gusty and blowing up to 17 m.p.h., Ewen put up a good flight on the 28-h.p. Deperdussin, going round by Mill Hill, while on Wednesday, with the wind at 15 m.p.h., he gave a little exhibition, at the request of some notable visitors from Brooklands. In the evening the wind died down, and the pupils had the school Blériot out. On Thursday morning Ewen was out early doing a 15-min. flight on the Deperdussin, and W. T. Warren made some good flights on both the Deperdussin and Blériot. In the afternoon,



AT THE BRISTOL FLYING SCHOOL AT BROOKLANDS.—Some aviators and pupils. From left to right, top row, Lieut. Smith, Mr. Collins Pizey, head of the Bristol School at Brooklands, Mr. Carfrae, and Mr. Lane. In the bottom row Mr. Merriman, and Capt. Weeding are standing to the right of the picture.



The Flanders Monoplane, showing modifications since reconstruction. Note the silencer to the 60-h.p. Green engine. Also the position of the radiators between the planes and the cabane. The apparent slenderness of the struts of this is due to their being of stream-line section.

Captain Loraine put in several splendid flights on the Blériot, while M.M. Dubois and Beaumann were persevering with straight flights, increasing their height and perfecting their landings.

Salisbury Plain.

Air Battalion.—Owing to the frosty weather there is little to record in the way of flying. On Wednesday of last week Capt. Fulton had his Deperdussin monoplane out, and Lieut. Barrington-Kennett and Lieut. Conner and Lieut. Manisty put in some scouting practice on Bristol biplanes. Thursday was a good day for flying considering the time of the year, and Capt. Fulton on the Deperdussin, Lieut. Conner on the two-seated Blériot, Lieut. Barrington-Kennett on the Nieuport, and Lieut. Manisty on a Bristol biplane, all made good flights. On Friday the continual snow showers prevented any air work, but there was plenty to do in the hangars. Although Saturday morning was fine generally, the wind was very treacherous, and so no flying was done until the afternoon, when Lieut. Manisty made one or two trips. Sunday and Monday was blank owing to bad weather, but on Tuesday Capt. Fulton and Lieuts. Reynolds and Conner were seen making good flights. Lieut. Manisty was unfortunately seriously injured in a motor cycling accident on Saturday last. He was riding with Mr. Roger Harrison and Lieut. Ashton, pupils of the Bristol School, when his machine touched the bank at the side of the road, causing him to fall. Unfortunately, Lieut. Ashton was riding so close that he was unable to get past, and was also brought down, but he was not so seriously hurt as Lieut. Manisty.

Bristol School.—Jullerot, on Wednesday last week, as usual, started work with a trial, after which Lieut. Harrison, Lieut. Ashton and Bendall each did one solo. Hotchkiss made his *début* as a monoplane flyer, taking up one of the single-seater machines for a ten-minutes' flight, on which he was quite successful. After this, Jullerot piloted the same machine, and was flying for eight minutes.

Next morning Jullerot was using one of the single-seater monoplanes, Hotchkiss following him on the same machine. Capt. Gilbert, of the Italian Army, was flying biplane No. 43, afterwards making a pretty flight on one of the school monoplanes. In the afternoon, Bendall took his certificate, observed by Mr. Cockburn and Lieut. Manisty. Jullerot made a short solo on biplane No. 43, on which he was followed by Capt. Gilbert. Jullerot then made a short flight on the Bristol military monoplane.

The wind on Saturday morning was too rough for any flying, but things had improved considerably by the afternoon. Jullerot made two trials on biplanes Nos. 43 and 66. Capt. Gilbert put two solos to his credit as did Lieut. Ashton. Lieut. Bowers also got in biplane flight, and Hotchkiss took Mr. Roger Harrison for an instructional flight. Lieut. Bowers went up on the military monoplane for the first time *solus*, flying well at 800 feet, and finishing with a perfect *vol plané*.

AIRSHIP NEWS.

Dirigibles at Review.

WHILE the troops were being reviewed at Versailles on the 25th ult., two dirigibles made their appearance, the "Adjutant Reau" steering its way through the fog from Issy, while the "Capitaine Ferber" was piloted over from St. Cyr by Count de la Vaulx.

"Lieut. Selle de Beauchamp" After Height Honours.

ON the 25th ult. the French military dirigible, "Lieut. Selle de Beauchamp," was brought out at Moisson with the intention of attacking the height record, but after cruising for 30 mins. it was found that the mist impeded the work so much that it was considered advisable to suspend operations.

A Long Cruise by "Selle de Beauchamp."

ON the 4th inst., the dirigible "Selle de Beauchamp" left Moisson in the morning and cruised in the direction of Evreux, landing after a couple of hours at the Argences Camp, about 15 kiloms. from Caen. The return journey was made in the evening.

Sudden Deflation of "Selle de Beauchamp"

WHILE undergoing a third and final test before being taken over by the French Military authorities, the dirigible "Selle de Beauchamp" was overtaken by a gale, which necessitated a landing being made at Moulit. The wind instead of going down increased in force to such an extent that the pilot deemed it necessary to tear out the ripping panel, and the airship was thereupon packed up, and sent back to the Lebaudy works, at Moisson, by rail.

"Capitaine Ferber" Over Paris.

Two cruises of an hour and a half each were made by the Zodiac dirigible "Capitaine Ferber" on the 3rd inst., and during one of the trips the dirigible passed over Paris, while the other one was made in the direction of Mantes. The airship was also out on

the previous day making a circuit which passed over Chambourcy, St. Germain, Courbevoie, Mount Valerien, St. Cloud and Versailles.

Bomb Dropping from "Adjutant Reau."

THREE ascents were made by the dirigible "Adjutant Reau" on the 3rd inst., one trip taking the dirigible over Paris. In the course of another trial, some experiments were made in bomb-dropping by Captain Sazerac de Forge, who launched several projectiles on a target at Chalais Meudon.

"Parseval II" at Tegel.

LEAVING Bitterfeld at 11.10 a.m. on January 26th, "Parseval II" passed Juterbog at 12.15, Teltow at 12.25, Grosslichterfelde at 1.2, and arrived at Tegel at ten minutes past one.

Tests with "Parseval XI."

WHILE undergoing tests, on the 2nd inst., previous to being taken over by the German Military authorities, the "Parseval XI," owing to one of the elevating ballonets not working properly, collided with an embankment behind the targets at Tegel. A large hole was torn in the envelope which will necessitate some delay in the carrying out of further tests. The envelope is 96 metres long and has a capacity of 10,000 cubic metres. The power plant consists of two 200-h.p. Koerting motors. On the 30th ult., speed tests were carried out over a course of six kilometres from Tegel to Hermsdorf. No official details have been published as to the results obtained and the speeds given by unofficial sources vary between 63 to 75 kiloms. an hour.

High Speed by Siemens-Schuckert.

THE great Siemens-Schuckert dirigible, which is fitted with our motors, coupled in pairs in the forward and rear cars, has been undergoing some speed trials. The best records show a speed of 71.5 kiloms. an hour.

AIR EDDIES.

IN great contrast to the propensities of the early Anzani motors to generally overheat and bombard cylinder heads at intervals, are the results now obtained with this engine. Since the rush that followed the crossing of the Channel, the whole organisation has been thoroughly overhauled, and the workmanship evident in their current productions, is of the very first order.

Evidence of this is furnished by the tests that have been applied to two motors, supplied at random from that firm's Paris stock, under the supervision of the Army Aircraft Factory authorities. One 6-cyl. 50-60-h.p. radial engine and one of the new 35-h.p. Y-type motors were mounted on the bench and in the presence of Mr. Laurence Santoni and M. Norbert Gailot, the Paris manager of Anzani Motors, they were run, the former for a period of six hours, and the latter for five. Excellent testimony of the efficiency of their air-cooling is the fact that, although the draught from the propeller was alone relied on to effect this, it was possible in both cases to bear the naked hand on the cylinders before the engines were finally switched off. As regards the regularity of the power generated, it was noticeable that in both cases the indicator-needle did not fluctuate more than a few points throughout the whole of the test.

That the 35-h.p. Y-type should give such a satisfactory result with only one-third of its normal amount of lubricant is more than suggestive of its economy. At the completion of the test it was found that less than one gallon had been pumped from the tank, whereas in the ordinary course of events it should have received $2\frac{1}{2}$ gallons during the five hours. The intense cold was responsible for this, as, the oil becoming semi-coagulated, the pump did not receive its full charge at each inspiration.

Talking about engines, I had an opportunity the other day of seeing a new rotary engine, the invention of Mr. William Cochrane, of Clarges Street, W., running. Its chief feature of interest is a new form of rotary valve, combining the advantages of both the sleeve and the disc variety, and eliminating to a certain extent some of their individual disadvantages. It seems to me that it might be very successfully applied to an aeroplane engine, especially as silence is getting to be such a "desirability" these days.

Enthusiasm is beginning to show itself in Scotland, at any rate on the East Coast. An aero club has been formed, the headquarters being Edinburgh. The society is being placed on a very business-like footing, Mr. George Wilson, the well-known managing director of the *Edinburgh Evening News*, being a very enthusiastic president. One glider has been secured, while Mr. Wilson has offered a second, and at an early date a power-driven machine is to be introduced, and members of the club will be able to make use of this machine at specially reduced rates.

"At last! The parachute for aviation purposes is emerging from its experimental stages with dummies." Thus is introduced an article, in one of our Paris contemporaries, on the project of the pilot, Guillaume, to test the Dangy-Baillet parachute system, by rising in his monoplane to a convenient height, switching off his engine, abandoning his controls, and allowing himself to drop gently (?) to the ground, while his monoplane, hurtling to earth, dashes itself into a thousand pieces not far distant. But a very curious and sad coincidence it was, on the same morning that this article appeared that the poor tailor, Reichelt, obsessed with the idea that his parachute system could not possibly fail, threw himself from the first platform of the Eiffel Tower, with his device strapped to his shoulders, and was dashed to death.

It seems a rather unwise policy to start flying away on a strange bus without first examining the controls, both of the engine and of the machine itself, and becoming thoroughly acquainted with their

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An Aerodrome at Harrow:

THERE seems every likelihood of London having a new aerodrome in its close vicinity, as negotiations are in hand for the making of an aerodrome at Northholt, just south of Harrow. The piece of land in question is some 260 acres in extent, and after the removal of about a mile of hedge will be quite suitable for flying.

The railway facilities are fairly good, as Northholt Junction Station on the G.W. and G.C. joint line is on the ground, while Eastcote, on the District Railway is quite close, and the aerodrome is bounded by two main roads.

action. Yet, through oversight and carelessness it is a thing which not infrequently occurs, and which might possibly lead to serious accident. It will be remembered that the late Cecil Grace underwent an experience of this kind when trying a Blériot monoplane for the first time at the Blackpool meeting the year before last. Mr. Tom Garne, I understand, was the subject of a very similar incident about a week ago when trying, for the first time, a new monoplane he had purchased from Messrs. Radley and Moorhouse. Originally intending to do a straight flight, he was compelled to fly around for about half an hour before discontinuing. The incident ended in a certain amount of *bois cassé*.

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As the time for the closing of the competition in connection with the Army and Navy Mortimer Singer prizes draws nigh, we may safely expect a greater display of vigour from our Service aviators in their efforts to acquire them. Although entries have up to the present been received from an excellent representative of ten of our Army and Navy pilots, the performances so far recorded only number three.

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There are rumours about that the very closely-guarded construction of a biplane is proceeding under cover in the grounds of the residence of Princess Wiasemsky at Upper Norwood. This mysterious machine is being constructed to the designs of Prince de Bolotoff, this Russian lady's son, who will be remembered as having taken a practical part in aviation in the early days. That he is taking up aviation again makes one wonder if this decision has resulted from any spiritualistic communications through Mr. W. T. Stead or his medium, "Julia," for it was through a message delivered to Bolotoff from the spirit of poor Lefebvre, *via* these media, that the Russian Prince abandoned his original experiments at Chalons on a triplane that had been built to his specification by Gabriel Voisin.

• • •

It may be remembered that some time previous to warning de Bolotoff against the dangers of aviation, Mr. W. T. Stead wrote to the *Daily Mail* an amazing, and for the most part inaccurate, article on the wonders that were to be achieved by this machine, the invention of one who at the time had only just attained his majority, and who, it was admitted, had "never had any technical engineering education," when it was eventually constructed. At that time, I recall, my Editor had occasion to protest against the very highly-coloured claims that Mr. Stead publicly made for this machine before the machine had taken practical form, and certainly before that gentleman had sufficient grounds on which to base his extravagant assertions. I can quite believe the last man in the world who would have wished such outrageous claims to be made, under the circumstances, was Prince Bolotoff himself.

• • •

Some of the peaceful residents of Rhyl have been somewhat perturbed lately by a note which appeared in a local paper to the effect that during one of the fine flights Vivian Hewitt has been making lately on his Blériot, he fired some shots from a revolver. It appears, however, that the enterprising reporter heard a missfire or two and jumped to conclusions.

• • •

Friend W. H. Ewen is just back from a trip north, where he was engaged last week-end in manufacturing a new organ which he has had built near Edinburgh. Although our aviators still find the wind a very troublesome and annoying thing, Ewen seems to be in a happy position in this respect, for he tells me that it is sometimes very annoying when you cannot get enough wind. But it must be understood that in this respect he only refers to when he is air demonstrating on the organ.

"OISEAU BLEU."

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A Parseval for Chicago.

AN order has been received by the Parseval Company from the Aero Club of Illinois for a dirigible to carry twenty persons, which it is proposed to utilise in making excursions in the neighbourhood of Chicago.

Dirigible Helps Map Makers.

A LONG reconnoitring cruise was made by the dirigible "Adjudant Vincenot" above Toul and Nancy and the surrounding country on the 31st ult., mainly in order that some officers might take notes with a view to drawing up a special map of the vicinity for aeronauts.

FOREIGN AVIATION NEWS.

New Records Passed.

AT a meeting of the Commission Sportive Aeronautique on Monday last, the passenger height record of 2,700 metres of Prevost, and the speed records from 5 to 150 kiloms. of Jules Vedrines, were accorded official recognition.

A New French Prize.

THE Seine General Council has again offered a prize for the encouragement of aviation. The prize, 5,000 francs, has been placed in the hands of the Ligue Nationale Aerienne, who will organise a competition for it.

Special French Uniform for French Aviators.

THE French Minister of War has decided upon the special uniform for members of the Aviation Corps. It consists of a Breton cap, blue jerseys, dark blue knee breeches with red stripes and blue putties. For rough work the aviators will also be supplied with a black leather uniform.

An Aerodrome for Toul.

AFTER somewhat lengthy negotiations, the French Military authorities have decided to arrange a Military Aerodrome at Toul, the site selected being at St. Mansuy, just by the fortress, which has an area of 100 hectares.

A Japanese Biplane in France.

GREAT interest has been taken in France in a little biplane, very much on Avro lines, built to the design of Baron Schigueno. The framework is of steel tubes, and the main plane is of 9 metre span, while the lower plane is 6 metre span. The machine weighs 300 kilogs., and is fitted with a 30-40 h.p. Gregoire-Gip motor. The rudder is circular in shape, and has painted on it the Japanese Standard.

A Military Train Monoplane.

A NEW monoplane, one specially intended for military use, has just been built by M. Train, and is now undergoing its trials. In general appearance it follows its predecessors, although the chassis is now left quite open. The new machine has a span of 9 metres, while the lifting surface is 16 square metres. The machine weighs 260 kilogs.

Clement-Bayard Monoplanes Flying Across Country.

THE first cross-country flights with Clement-Bayard monoplanes on the 3rd inst. were very successful. Guinard on one machine left Issy at 3.40 p.m., and 55 mins. later landed at the Corbeaulieu aerodrome, near Compiègne. Just previously Chassagne on a similar machine left for Chalons, but he lost his way, and landed at Villeneuve-les-Charleville after flying 125 kiloms. On Tuesday he flew on to Rheims, calling at Chalons on the way for petrol.

Doings at Hanriot School.

ON the 30th ult. Hanriot père took M. Monthois for an hour's flight, while Marcel Hanriot was testing some machines for the French Army. On the 1st inst., Coratte made a flight of 50 kiloms. at a height of 150 metres, and on another machine Dubreuil carried a useful load of 200 kilogs., while Marcel Hanriot paid a visit to Vitry-le-Francois.

Vedrines' Cross-Country Trips.

STARTING from Narbonne, Vedrines on the 30th ult. flew on his Deperdussin monoplane to Carcassonne in 14 mins., and on the following day returned, although it was freezing hard at the time. On Sunday he was at Toulouse again and gave another lecture, much to the appreciation of his audience.

Another Savary for French Army.

THE last Savary biplane of the 1911 order from the French Government was tested by Frantz at Chartres on the 31st ult. With its 70-h.p. Labor motor it had no difficulty, in spite of the strong wind, in rising 300 metres in 6 mins. with a useful load of 225 kilogs. on board. The speed was given as 92 k.p.h.

From Buoy to Etampes.

ON his Henry Farman biplane Gougenheim, on the 31st ult., went over from Buoy to Etampes, making a call at Nogent-sur-Seine on the way.

Six Hundred Landings.

LIEUT. GAUBERT, on his Borel monoplane, at La Vidamee, on the 31st ult., was flying for well over two hours, during which he made ten landings of brief duration. At the end his diary showed that he had made 600 flights since he had taken up aviation, and all without any accident or mishap to the machine.

Cross-Country Flight on a Blériot-Viale.

USING his Blériot monoplane, fitted with a Viale motor, Lusetti went from Sable to Chateau-Gontier, a distance of 32 kiloms., in a quarter of an hour on the 1st inst. Two days later he flew on to Laval.

Flying round Buc.

GORDON BELL made a fine circular trip over the environs of Buc on the 1st inst. He kept his R.E.P. monoplane at a height of 400 metres and landed by a very fine glide. Lieut. Vogoyeau, on a Maurice Farman biplane, also flew over Buc and Chateaufort and along the Chevreuse Valley. On the 3rd inst. Lieut. Bordage was up on his M. Farman for an hour and a half, while at the R.E.P. school Scholefield made a half hour's flight and Gordon Bell indulged in some fancy flying.

Doings at Sommer School.

ON the 1st inst. at Douzy, Bathiat gave some demonstrations with the Sommer monoplane before some visitors from Belgium, and Molla carried five passengers in the "aerobus" to a height of 300 metres, and brought them down *en vol plané*. Robinet was flying the all-steel biplane, and took it to a height of 1,000 metres.

Verrept Climbs High with Passengers.

BY way of practice, in view of further attempts on the passenger height records, Verrept, on the 1st inst., took two friends on his Borel monoplane at La Vidamee, to a height of 1,200 metres.

No Rush for Target Prizes.

UP to the present no great interest seems to have been aroused by the Michelin Target prizes, and the first two rounds have had to be abandoned owing to there being no entrants.

From Buc to Etampes.

FLYING by way of Rambouillet, Ablis and Agenville, Maurice Farman on a military-type biplane, and Renaux on one of the new small M. Farman biplanes, on Sunday, went in company to Etampes in order to inspect the Farman School there. On Monday, Lieuts. Noe and Nicaud, each with a passenger, also flew from Buc to Etampes and back on M. Farman machines.

Cannes Meeting Prizes Paid.

AT last the aviators who won prizes at the Cannes Meeting at the beginning of April, 1910, are to receive their prizes. As a result of legal proceedings, the members of the Organising Committee have had to make up the prize money, 60,000 francs, which will be divided as follows:—Popoff, 15,000 francs; Christiaens, 14,000 francs; Crochon, 14,000 francs; Edmond, 6,100 francs; Frey, 5,100 francs; while Molon and Baratoux share the rest.

Tests with Voisin Canard.

ON a Voisin Canard, on the 2nd inst., Colliex started from Issy and came down on the River Seine. After several experiments in rising and alighting, the aeroplane was taken up to a good height and piloted back to Issy.

Fast Trip on Sommer Monoplane.

MAKING his way through the fog, Bathiat on the 2nd inst. flew a military monoplane from Mouzon to Rheims in 55 mins. and delivered the machine to its purchaser, Lieut. Pierra.

A Mishap at Nice.

WHILE making a trial flight on his machine at Nice on the 31st ult., Guillemard, as the result of his motor stopping suddenly, crashed into a telegraph post. The machine was smashed, but fortunately the aviator escaped with but slight injuries, and in fact was able to be at the aerodrome on the following day. As the accident will involve Guillemard in a heavy pecuniary loss, the other aviators at the California flying ground, Count Robillard and Morin, Poumet and Laurens have arranged to get up a benefit meeting for their friend.

A Curtiss Hydroplane at Nice.

ON Tuesday Mr. Hugh Robinson, on the Curtiss hydro-aeroplane which he has brought to France for M. Paulhan, made a flight of half-an-hour's duration at Juan le Pins, just by Nice. It is probable that M. Paulhan will also be flying the machine himself.

Mathieu Qualifies for French Military Brevet.

ON Sunday Mathieu made the third flight for his military superior certificate, his course being from Issy to Malleville, close to Essonnes, and back.

Models

Conducted by V. E. JOHNSON, M.A.

Steam-Driven Models.

QUITE a number of more or less successful steam-engined model aeroplanes have been constructed, the most famous being that of Professor Langley, which, on November 28th, 1896, flew about three-quarters of a mile in 1 min. 45 secs., and on another occasion half a mile in 90 secs. It was, however, a large model weighing some 30 lbs. One quarter of the weight was made up of the motor and generating plant. The weight of the complete plant worked out at 7 lbs. per h.p. The engine was from 1 to 1½-h.p. The boiler was of the flash type, the steam pressure 100 to 150 lbs., and the relief of copper. Through the centre of this coil was driven the blast or flame from an "Alopile," a modification of the naphtha blow-torch used by plumbers, the flame of which is about 2,000 F. A pump was used for circulation purposes. The entire model took a year to construct, employing the best mechanical help available at that date.

Ten months after Langley's results some experiments were carried out by the French at Carqueze, near Toulon. The total weight of this model was 70 lbs., the engine rather more than 1-h.p. Twin propellers were used, as in Langley's case, but in the French experiments one was put in front and the other behind, an interesting fact, and probably the first time this was used in actual practice. The maximum velocity is stated to have been 40 m.p.h., but the actual length of flight was only 154 yards and duration a few seconds, a result which compares very poorly with Langley's. The span of this model was a little more than 6 metres, and the surface rather greater than 8 square metres. In the case then of large models, i.e., models from 1 to 1½-h.p., we see that success has been attained with all three forms of motor, viz., the petrol, the carbonic acid, and the steam motor. Turning now to smaller models, are the results already obtained with the last named better or do they give more promise of success than with the other two? As we have already seen, the petrol motor is apparently out of count; the CO₂ motor a somewhat doubtful factor. What of the steam?

On September 10th last, a small steam-driven model, total weight 3 lbs., built throughout by Mr. H. H. Groves, made several successful flights at Blackheath; the model proved itself capable of rising from the ground under its own power, and when hand launched it flew 150 yards. Not a long flight compared with Langley's, but one must remember the difference in the size of the models, and also that the duration of Mr. Groves's steam plant was only 30 secs. The loading was 12 ozs. to the sq. ft., and the soaring velocity therefore some 20 m.p.h. The total weight of the power plant was 1½ lb. Propeller thrust 10 ozs. to 12 ozs. Since the total weight of the model was 48 ozs., this last-named fact shows the high general efficiency of the machine.

The type of steam plant used was flash boiler, pressure fed—the fuel benzoline.

We might just mention—though it is perhaps scarcely necessary—that the above flight is a properly authenticated one, and that photographs were taken of the model in actual flight.

Since then Mr. Groves has constructed another model—a pound more in weight—but with a power plant of 2 mins. duration, and a propeller thrust of 1 lb. And he is now only awaiting a favourable opportunity to test this model in actual flight.

At the meeting of the Kite and Model Aeroplane Association on Thursday last the subject of motors, other than rubber, was very much discussed in a delightfully free-and-easy way at times, and at others in the most scientifically approved manner; and there was no doubt of the general consensus of opinion prevalent, and that was that so far as small power-driven models are concerned it was the flash boiler steam type first and the rest nowhere. By small models we mean models up to a few lbs. in weight. (No comparison between steam, &c., and rubber is here intended.) Several interesting engines were exhibited, amongst others a little steam motor by Mr. Stanger (of model petrol engine fame), weight 1½ ozs., complete plant 5 ozs., to run 3 mins. at a 10-lb. pressure (we quote these facts from memory). Mr. Stanger also showed his beautifully made petrol motor referred to quite recently. We know also of quite a number of others, all of whom are working practically on these same lines. This is, of course, in the neighbourhood of London alone, and we feel sure that other large towns and the provinces are not idle in the matter. The result of all this we are confident will be that we shall see in the course of the next few months, a successful power motor—guaranteed to give

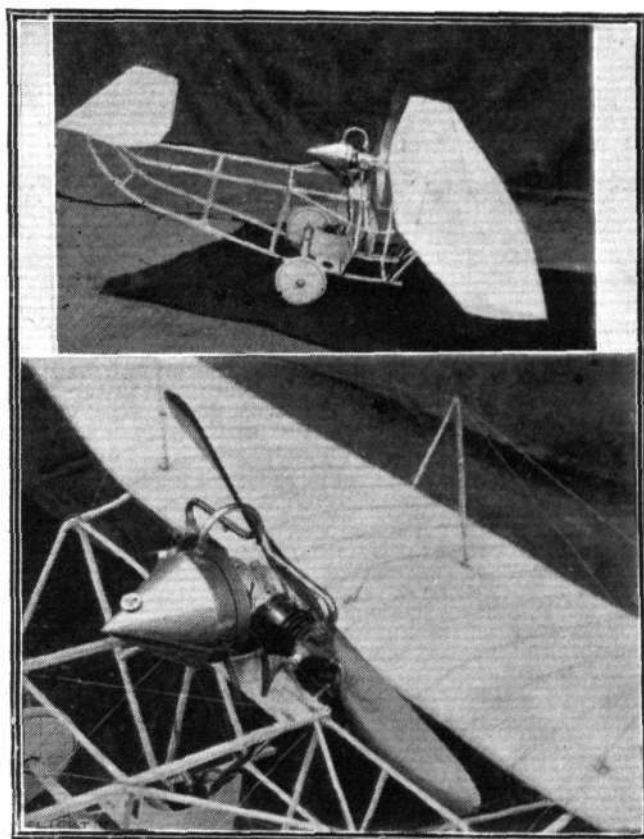
sufficient propeller thrust to fly any model aeroplane of good design and workmanship—at a moderate price. And what more does the aeromodelist want? It may interest our readers to know that we have sufficient personal confidence in this form of motor to give it a practical test, and that an expert in such matters is making a steam plant with which we shall—all being well—be experimenting in a month to six weeks. Naturally at present we are not prepared to publish any further particulars, but when the experiments are actually carried out we shall at once proceed to place them before the readers of FLIGHT.

Fins.

Referring to some remarks in last week's issue, *re* the above, Mr. John Clive (who has made a special study of the subject) writes as follows:—

"I have found that the propeller or propellers have very much the same effect as a fin or rudder when placed right in the rear; thus in Mr. Allport's model a vertical fin is rendered unnecessary. Of course, the right place for a fin would be behind the propellers, but as this would be somewhat difficult to arrange, one placed above the *empennage* would answer. A small, very small, fin right in front of and above the centre of gravity would give the model more sense of direction, by acting as a fulcrum, as in the Wright and Valkyrie and Bréguet machines, although, for some unexplained reason, these have their 'blinkers' below the c.g. If the fin is in front, it should be very small, or the machine seems to lose all sense of direction and dives. The reason for placing the fin above the c.g. is to prevent excessive banking, as when the fin is inclined it lifts away from the lower side and rights the machine; however, the side-slip that always accompanies a turn would appear to cant the machine more when the fin is on the top, but the lifting effect may possibly overcome this."

Mr. C. C. Allport also informs us, with respect to his model illustrated in January 27th issue, that when the model was first made a fin was put in front, but this did not make the model fly straight—it always circling to the right or left. When the fin was set (like



Messrs. T. W. K. Clarke and Co.'s petrol-driven model. Below is a part view, showing the motor, battery, &c.

rudder) to make it go in any direction, it always followed it, but when it was adjusted for a straight flight the model always curved off one way or the other. So far, Mr. Allport has not tried a fin at the back, but is about to do so.

Messrs. T. W. K. Clarke and Co.'s Petrol-Driven Model.

We give this week two illustrations of a very interesting petrol-driven model constructed by the above firm, one cut showing the model as a whole, the other the power plant, propeller, &c. Overall dimension 5 ft., total area 13'3 sq. ft., span of main plane 7 ft. 8 ins., of front plane 3 ft. 6 ins.; axle of wheels rubber-bound to frame, so that on alighting the model can make use of its skids as well as its wheels; total weight 16 lbs.; engine battery, &c., inclusive, 8 lbs. 14 ozs.; power 1-h.p. (rather more, as a matter of fact). The engine, it will be noticed, is a two-cylindered one. The reader should note the large diameter of the propeller, the elevated position of the motor, and how all the weight of the power plant is (comparatively speaking) placed at the centre of gravity.

A New Polish for Propellers.

W. H. Norton writes: "After having made my propellers,



THE KITE AND MODEL AEROPLANE ASSOCIATION.

(27, VICTORY ROAD, WIMBLEDON.)

The Paramount Body to Govern Models in this Country.

OFFICIAL NOTICES.

A most enjoyable evening was spent on February 1st, when a discussion on "Propelling Plant for Model Aeroplanes" was opened by Mr. J. H. Ledebor, M.A. The discussion that followed proved very interesting and instructive, and was sustained by Messrs. T. W. K. Clarke, G. P. Bragg-Smith, C. R. Fairey, H. H. Groves, A. Stanger, R. F. Stedman and E. W. Twining. During the evening Mr. Stanger showed his four-cylinder petrol engine and Mr. Stedman his six-cylinder steam engine, both being admired by those present.

Colonel Fullerton, who presided in the absence of the President, said that he was deeply interested in model work, and that it was of great use and that much could be learnt from a model which was not so costly as a full-size machine. In future would-be-makers would do well to prove their ideas for a cost of about £6, including engine, instead of expending hundreds on the machine that perhaps would be of no use.



PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

MODEL CLUBS.

Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

A SUCCESSFUL social was held on Saturday last at above address. Mr. Ross showed his new model, which is in for "duration" at to-day's (Saturday) competition at Palmer's Green. Mr. Corder also brought along a good selection of parts and materials. Flying every week-end now at club's flying ground, Bishop's Avenue, East Finchley, N. (Messrs. Vivers and Sons, Lodge Farm Dairy).

Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

MR. E. TRYKLE was last Saturday experimenting with a new twin-screw model, which showed itself capable of doing some fair flights, the best flight being 250 yards in about 35 secs. Mr. M. Vale, who in the early part of the afternoon was not obtaining any long flights, gave us a big surprise when he fitted an old plane to his model, and almost immediately obtained several very fast flights of 300 yards. Some good entertainment was provided when the old model glider was brought out, and although now somewhat dilapidated, a large number of towed flights were made.

Blackheath Aero Club (12, MANOR ROAD, BROCKLEY, S.E.).

ON Saturday last members of the club were practising at the Kidbrooke ground, and some good flights were made by Mr. L. Swann with his "A" frame monoplane and also by Mr. G. Brown, who was experimenting with a new "tractor" model. This machine would only fly when fitted with a cambered main plane, which result is contrary to that arrived at by Mr. Dollittle, who uses flat planes. Other flights were made by Messrs. S. Woollard, Pizey, Peters, Hoch and Egelstaff, who are preparing for March 9th, when a "point-to-point" contest will be held at 3 p.m. on the Kidbrooke ground. A silver cup will be presented to the member who completes the course—a triangle—in the least number of flights. Last week several members indulged in moonlight flights, and

I polish them with black lead (stove polish), which makes them waterproof and gives them a good polish, and is lighter than varnish.

Replies in Brief.

E. N. JOYCE.—You must send full particulars and dimensions—a good scale drawing is best; also surfaces, weight of rubber, the number and diameter of propellers, pitch, &c. *It is absolutely impossible for anyone to give an answer worth anything unless this is done.* It may seem a lot of trouble to have to take for an answer which may be contained in three words or even one; but that is a matter which cannot be avoided. We must decline to answer questions where full particulars are not given, because it is in reality nothing more nor less than asking us to undertake an unfair responsibility. The (apparently) trivial details are not unfrequently the most important.

S. CARTER.—We are unable to find any drawing bearing your name. We have one unnamed—length 36 ins., span 24 ins., and 8 ins. between propeller bearings. Presuming this to be yours, the weight is not excessive, but you should use 12-in. propellers, and the base of your triangular framework is unsuited to such a size. A plain right-angle light iron or steel bracket answers very well, or one of steel wire, properly stayed, is also very good.

Nominations.—Nominations for the Council have been received

Registration of Model Aeroplane Performances.—Applications have been received from Messrs. G. Rowlands and H. Weston (both being for distance) at the time of writing, but many more are expected, especially from those who claim to hold records. The necessity of having certain days for observing flights becomes more apparent each week, and no records will be recognised except those observed by the official observer of the association.

Official Observers.—All clubs sending in applications for the appointment of official observers, should state the qualifications of those they wish appointed, but no observer can officially observe a flight of a machine that he is interested in.

Applications for appointments will be considered on the fourth Monday of each month by the Council.

W. H. AKEHURST, Hon. Sec.

Messrs. Brough and Waghorn each lost a model whilst participating in these flights.

There will be the usual flying at Blackheath, Kidbrooke and Lee, and all interested in model aviation are invited to visit any of the B.Ae.C. flying grounds. A map, illustrating the exact locality of these grounds, will be forwarded to anyone making written application to the above address.

Brighton and District Model Ae.C. (36, LITTLE PRESTON ST.).

IDEAL afternoon for flying on Saturday last at Brighton-Shoreham Aerodrome. Mr. Bate turned out with a huge box of models. He was soon testing a big 4 ft. 12-oz. monoplane. Considering the wind and the fact that the model was only roughly strung together for testing, it showed great promise. Loading very light, only 7 ozs. to sq. ft., the wings being 1 3/4 sq. ft. So far it flies on little over 2 ozs. of rubber. To-day (Saturday, 10th) should see an interesting duel between this and Mr. Burghope's big 21-ouncer. In the latter case the loading is 12 ozs. sq. ft. and flies on 6 1/2 ozs. of rubber. It is also 6 ins. shorter than the lighter machine. The wing surfaces of the two are practically identical, indeed, Mr. Bate has closely followed Mr. Burghope's design throughout, but departs from it, however, in fitting geared motors. A small model weighing 2 3/4 ozs., flown by Mr. Bate, climbed to an extraordinary height, keeping her nose up and rising à la Cody biplane. It covered rather over 1,200 ft. on several flights. Mr. Burghope was out with several small models, getting something above 1,000 ft. out of a 4-ouncer. His small 2-oz. monoplane, which generally gets up to over 150 ft. with a rush, refused to climb, but flew 930 ft. instead.

Cardiff Aero Club (114, MISKIN STREET, CATHAYS).

THIS club is now on a very firm business footing, with a list of members all keen in the work. Excellent premises, comprising workshop, reading-room, meeting-room and lavatory, are now in-

stalled. Meetings are held three times a week, the workshop being the scene of great activity. Crawford Griffiths, late of Arundel House School Aero Club, has joined as a member. F. Crouch was flying his 2-ouncer well during the week, and his rise-from-the-ground model rose and flew 100 yds. at 20 ft. high many times.

A contest is to be held on February 17th, at Cathays Park, and a meeting is called for February 12th, to decide the classes and to settle some important business. Will all members make a special effort to attend and bring models.

Dover and District Model Ae.C. ("OAKVILLE," GODWYNE ROAD)

AN interesting model flying meeting was held on Wednesday afternoon last on the Northfall meadow. H. Holman's monoplane made some excellent flights. H. Holman has offered two pairs of 8-in. propellers for the first model to rise from the ground. It has been suggested that the club is too advanced for beginners, but we should like to point out that we have amongst our members not only those who are fairly proficient, but also others who are just starting. The former are pleased at all times to assist any members who are less advanced than themselves.

Ealing and District Model Ae.C. (1, QUEEN'S GDNS., EALING, W.)

THE club held a flying meeting on the 3rd inst. In spite of the frozen conditions and high winds seven members turned up with models, while two new members were enrolled. L. Roche's model did not fly further than 518 ft. (measured) at a good altitude. Besides this he obtained numerous good durations, the best being 27, 30, and 32 secs. G. Beeching's monoplane made several good flights, though the speed was rather low. C. Roche is to be congratulated on his original biplane, evolved from paper gliders, which in its tests showed itself a good flyer. L. Kirchner, C. Roche, B. Kirchner, and P. Esch got several good flights each with their monoplanes, while C. Chilcott's single-propeller model flew very well.

A flying meeting will be held to-day, Saturday, at 2.30 p.m., at usual place.

Hackney and District Ae.C. (47, JENNER RD., STOKE NEWINGTON).

MODEL meeting last Saturday was transferred from Hackney Downs to Mill Fields owing to L.C.C. objections. Good flying was seen from all models present, especially by Mr. Gittas and Mr. Marmia's machines, in spite of adverse conditions. Meeting this Saturday is to be held on Hackney Marshes (Lee Bridge end) at 3.30 p.m., when a point-to-point contest will be held.

More members wanted for this club so that a glider can be obtained as soon as possible. Write for particulars to hon. sec.

Macclesfield and District Ae.C. (BLAKELOW RD., MACCLESFIELD).

ON January 28th, Mr. Fleat, late of Oldham Club, made the best flight of the day with his 4-ft. twin-propelled monoplane, covering 300 yards. This machine would do with making the main planes firmer, as it rolls very heavily. Mr. Horner's model covered 250 yds. Monoplane has two propellers and no fin or rudder; it flew quite straight on several occasions, and is quite stable; length, 3 ft. Other flights were made, varying in distance from 100 to 200 yards.

Paddington & Districts Ae.C. (133, BUCHANAN GDNS., HARLES DEN)

LAST Saturday W. Evans, at club's private flying ground, assisted by Mr. Waller, was testing four-bladed propellers on monoplane; machine very speedy, but only short flights obtained owing to exact positions for main plane not being located before darkness set in.

Next monthly general meeting will be held at club workshop Wednesday, March 6th, when Mr. M. Canning will lecture on "The Position of Planes and their Relation to Stability." Visitors welcomed.

Nearly £2 offered in prizes, mostly cash, for members' models; all competitions before end of June.

New members elected last week:—Messrs. Brown, Lane, Davidson, Chalfont, and Holden. Subscription, 1s. per month. Particulars on application to secretary.

Palmer's Green and District Model Ae.C. (15, MOFFAT RD., N.).

LAST Saturday arrived with ice and snow. Skating was taking place everywhere, and in consequence the novices' competition suffered, only two turning up to compete. Many members, however, braved the cold and got their models going. Mr. Lingard was the first to start with a single stick Mann-type. Mr. E. Brown had the misfortune to break his 2½-oz. model after a few flights. Mr. R. L. Rogers' machine was flying very well. His last flight, however, brought him ill-luck, as the model disappeared amongst trees. Messrs. Trollope, Reed and Redottee had good flights, and Mr. B. Brown produced a very light model from various pockets on his person, good duration times being made by this "featherweight."

Duration competition on Saturday, February 10th, at 3 o'clock. All are invited. Particulars from the secretary as above.

Polytechnic Aero Club (REGENT STREET, W.).

A COMMITTEE meeting of the above club was held on Friday, the 2nd inst., at the Polytechnic, when Prof. H. J. Spooner presided. Mr. Graham Wood announced that Mr. Weiss had offered him the famous "Weiss Glider," the use of the best gliding ground in the country, and the use of the large shed in which the glider is housed, and that he had accepted this munificent offer on behalf of the club. A gliding meeting is being arranged for Easter.

Members of the club have already commenced constructing a monoplane glider to Mr. Wood's design, and the prospects of the club seem particularly rosy.

Applications for membership should be addressed to Wm. H. Emerton, Hon. Sec., 17, Glenthorne Road, New Southgate, N., who will be pleased to forward particulars to anyone interested (ladies or gentlemen).

Scottish Ae.S. Model Aero Club (6, McLELLAN STREET, GOVAN).

ON Thursday evening of last week the members turned out in full force to Mr. S. F. Cody's lecture in the Athenæum held under the auspices of the Scottish Aeronautical Society. The address was an exceedingly bright and racy one, and the splendid slides and cinematograph films were well worth seeing.

On Friday evening there was a discussion on the work of the club during the coming summer, and several interesting items will be announced later.

On Saturday there was a poor turn-out at Ibrox owing to the skating being in full swing here. Messrs. Balden and Mills made some fine flights, as also did Mr. Gordon until he smashed his model in trying to dislodge it from a high tree. After some flying at the usual ground, it was decided to try the "air" in Bellahouston Park, where Mr. Balden's model made some really good flights from the hill. Though this park is considered one of the biggest in Glasgow, there is very little space available for model flying, and consequently is only suited for very small models. The cold during the afternoon was so intense that the lubricant on the elastic actually froze, also the air seemed very varified, the duration of the flights suffering in consequence. It would be interesting to hear of the experiences of other clubs under similar weather conditions.

Members and friends will please note that the next lecture will be held in the Institute, Elmbank Crescent, on Friday, February 16th, when Mr. W. J. Phillips, of the Anderston Library, will read an interesting paper on "Fictional Flight." All readers of FLIGHT are heartily invited.

The next competition for the aggregate prize will be held at Barrhead Aerodrome on Saturday, February 24th. Flying as usual at Ibrox to-day (Saturday).

Stony Stratford & District Kite & Model Ae.C. (OLD STRATFORD)

A GENERAL meeting was held on February 1st in the Public Hall, when there was a fairly good turnout of members. It is proposed to hold a small exhibition of models, &c., on February 29th, and members are requested to give particulars of what they intend bringing at the next meeting. After discussion of exhibition, Mr. H. Hamilton read a paper: "Aviation, its Principles, Performances and Prospects," this being the interchange paper received from the Conisborough and District Aero Society. An interesting discussion took place, in which Messrs. Matson, Moore, Field, Elmes, and the secretary took part.

The next meeting will be held at the club room, on February 15th, at 8 p.m., when an interchange paper from the Bootle and District Aero Club will be given, entitled "Some Points in Model Design," by A. G. Pugh.

Club duration now stands at 30 seconds, and is still held by Mr. C. L. Matson.

Members are requested to keep in mind the exhibition arranged for February 29th, at the club room.

Worcester Model Aero Club (VICTORIA INSTITUTE, WORCESTER).

THE club held their second monthly competition on February 3rd on their ground, Pitchcroft. The attendance was thin, owing to some members indulging in skating. Mr. Pollard raised the club records to 24 secs. duration and 200 yards distance.

The next meeting will be held on Saturday, February 10th, on Pitchcroft, at 3 p.m.

Yorkshire Ae.C. (Model Section) (5A, HULLAND ST., LEEDS).

OWING to severe snowstorm, last Saturday's competition was postponed till to-day (Saturday), and will be held at three o'clock on Woodhouse Moor, not Beckett's Park as stated last week. The club wish to thank Mr. Macpherson (Yorkshire Ae.C. Committee) as donor of the second prize, and Messrs. H. F. Braithwaite and Co., makers of the celebrated "HFB" model, for the third prize.

CORRESPONDENCE

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

Stabilising Devices.

[1483] Re letter No. 1476, from Mr. D. Townesend, and accompanying sketch of his device for maintaining stability. Supposing the aeroplane tilts to one side and the mercury opens the valve at B. The air passes into cylinder C, and, assuming the pressure to be sufficient, it moves the piston to its furthest extent. This rights the machine. When the mercury gains its original position the valve at B closes. The tube leading to cylinder C, and also the cylinder itself, are now, however, full of air at the same pressure as that in cylinder B. This must, in order for the device to work at all, be greater than the total pressure on the aileron when at the angle to which it has been moved by the working of pistons C and C. It is, therefore, obviously impossible for the pistons C and C to regain their normal positions unless the cylinders (or the tubes leading to them) are fitted with exhaust-valves which will open and shut according to whether the entrance to the tube be closed or open.

Again, would not the high pressure required render this device impracticable even if it (the pressure) is obtainable? At any rate, the cylinder containing the air. The tubes and smaller cylinders would have to be very heavy, and would also be liable to explode with a comparatively slight jarring. And finally, why should an aviator entrust the important function of maintaining balance to a mechanical device—which must be delicately adjusted, and must consequently require very little to prevent its working properly—when Lieut. Dunne has proved once for all that *natural stability* can be obtained by building wings a certain shape?

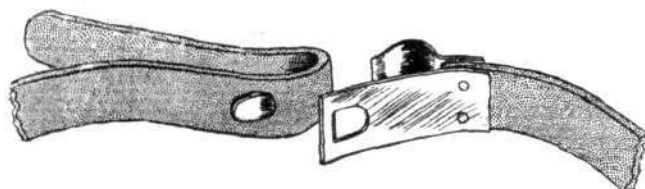
Nothing short of the wrecking of the machine could upset that balance.

N. Finchley.

CHAS. R. MILSOM.

Quick Release Devices.

[1484] In a recent letter someone wrote about quick release straps. I enclose a sketch of a patent strap (invented for fire



appliances) which may interest you. I have the rights for sale if anyone desires to acquire an interest in the invention.

Mere.

A. L. COWARD.

Bomb Dropping.

[1485] With regard to "R.A.'s" letter (No. 1481), and the article he referred to, I should like to make a few remarks.

For a great many purposes sight setting need only be approximate and must be simple.

In these cases a sight with a deflection scale on which wind, speed of enemy, &c., could be put would, no doubt, be quite accurate enough. But I believe that the sight described in my article could be used more simply and with sufficient accuracy by using only approximate settings. A considerable error in height causes only a small error in the "aerobar" setting. Probably, in the early stages of an attack, it will be possible to decide the height near enough to set the "aerobar" once for all. Then, also the wind can be estimated and the wind bar be set for speed, but not direction. In most of these cases (attacking troops, &c.) the enemy will be slow, uncertain and variable in its course, or motionless, so set the enemy bar to zero. Now all that remains to be done when about to let go a bomb is to finally set the height bar, and to swing the wind bar to the direction of the wind, by compass or land, chimney smoke, &c. The time of flight can be found (it might be engraved on the height pillar), the enemy's position estimated for the end of this time, and that spot aimed for. It must be remembered that an aeroplane can only drop a bomb on a given spot from one small space in the skies, so the bomb dropper is not likely to be called upon to suddenly set his sights.

The space in the skies just mentioned is so small that probably an aeroplane will have considerable difficulty in finding it. To enlarge this space, when the target is small, it may be found advantageous to carry some sort of light gun, with a horizontal range of a hundred yards or so.

As regards the bomb, "R.A." has, I believe, contributed an improvement to it. I am not sure whether by a "light tail" "R.A." means a string of bits of paper, or flat vanes through the

axis of the bomb. The objection to the string of paper pieces is the resistance it offers to the air, by means of which resistance it would keep the bomb straight. This resistance would be present whether the bomb were pointing in its right direction or not.

The flat vanes would only cause resistance when the bomb was getting off its trajectory, and so a bomb fitted with them would have a better coefficient of resistance than the paper-tailed bomb. It was such vanes that I tried to picture in my drawing!

But "R.A." saw them as portions of the threads of a screw, and I believe such a tail would be better. The tail would rotate the bomb and so make it steadier, or the size of the vanes might be reduced. Did our bowmen of old put screw feathers on their arrows?

As regards putting the sight in gimbals, instead of pivoting the height pillar, "R.A." has touched on a very nutty problem. I adopted the pivot method on the assumption that the aeroplane would always be moving in the direction of the aerobar at the same speed.

This assumption is certainly incorrect, but so is "R.A.'s" assumption that the velocity always remains horizontal and constant. I took the former assumption to be more correct.

Longitudinal tilts may be caused either by oscillations due to gusts, &c., or to the pilot's not keeping a correct height-line. In the case of oscillations, every part of the aeroplane has a different velocity. One can only say that the c. of g. is more likely than any other point to keep a constant velocity (I am open to correction here). In that case the bomb should be placed at the c. of g., but this is impracticable in any usual aeroplane. The variations of velocity due to the pilot's failure to keep a constant height-line are also difficult to investigate.

The whole matter of setting the aerobar, or devising a new sort of aerobar, needs a considerable amount of theoretical (and practical, too) investigation; that would occupy more time than, in the present state of the art of bomb-dropping, I am prepared to devote to it. In the meantime I believe, that is to say, I guess, that a pivoted sight is more correct than the gimbaled one.

As regards listing, both methods give exactly the same disposition of the parts of the sight.

While I am on the subject, it might be as well to remark that when using large, and consequently few bombs, sighting shots might be taken with small bombs having the same coefficient of resistance as the big ones.

Chatham.

S. H. S. M.

The Passat "Gull."

[1486] May I enquire if it is possible to learn what advantages or superiority M. Passat claims for his monoplane, which is reminiscent of Ader's machine with its foldable planes. A flight of 30 yards was claimed by M. Passat in imitation of the "sweeping motion" of beating wings, but we only saw M. Passat in the photograph standing at one end, similar to last week's illustration.

What is not clear is, if the experimental test as an ornithopter proved so satisfactory, why transform it into a monoplane?

In view of Ader's machine, and others now building with foldable planes, it is difficult to grasp any striking originality in the Passat machine. Does he intend to revolutionise the present warping of the main spars, or minimise longitudinal and lateral deficiency?

Chelsea.

JOHN GLEDHILL.

The Aeroplane in War.

[1487] Evidently "R.A.", by his letter 1,463, has little consideration for your space or belief in the intelligence of your readers.

I am not aware of asking "R.A." to discuss any matter but that relative to the war aeroplane, and if he can point out one idea which I have attributed to him without reason I shall be only too pleased to explain what led me to do so.

As to the technical side of his letter, perhaps it is only fair to give him a chance to explain why, after what was said in letter 1,453 with reference to the small spare lift available for the gun, he jumps to 25 or 30 cwt. He admits that I stated it could only be slightly heavier than the machine-gun.

I was discussing one aeroplane attacking another with a gun of slightly larger calibre than the machine-gun, not from the ground with a field-gun, I do not therefore understand why he talks of percussion shell, and wastes a paragraph on mad gunners. With a bullet or shell as small as that suggested a fuze is out of the question, and yet there is meaning in my language, the walls are released by a small spring operated by impact. "R.A.'s" impossible will not fit it for it has an actual existence, is simple and effective. I have termed it a mechanically opened or expanded bullet.

I do not sneer at shrapnel, but I doubt its effective use against aeroplanes for the reasons stated. "R.A." states that it is the shell which all modern artillerists use against aeroplanes. This is not

accurate; only Turkey has been in a position to use it. France and Germany are both experimenting with other shell. Evidently "R.A." doubts its effective use himself, for he writes of a "universal shell" and shrapnel with high explosive head(?) to be used in its place. If "R.A." wishes to be taken seriously by those interested in the subject, and their number is daily increasing, he must endeavour to keep to the point, give others credit for at least a knowledge of the elementary part of the game, and not turn a gun slightly heavier than a machine-gun into one of 25 or 30 cwt.

To prevent any misunderstanding, I challenge him as a gunner on the following points:—Has he ever heard of a 1 or 3-pr. Q.F.? Is there any reason why a gun firing a shot of from 3 to 6 ozs. should not be made? If so, what reason? If there is any reason why that gun should not fire a bullet or shell such as I have suggested? If a direct hit may be made by his machine-gun, what is to prevent the gun I suggest also making a hit, seeing that it could be on the machine-gun principle, and that I could, by sacrificing my bombs, &c., carry the same number of rounds as he? Which, in his opinion, would be the most effective against aeroplanes and dirigibles—an ordinary machine-gun bullet, or a mechanically-expanded shell, such as I have described? It inflicts a wound equal to about five times its diameter.

Again, seeing that my gun has the longer range, larger bullet, and the same chance of hitting the target, which would he consider the most effective?

Hassocks.

FRANK W. B. HAMBLING.

MODELS.

Model Construction.

[1488] Herewith please find a few sketches of two monoplanes which have proved very efficient fliers. Both models have exceeded the $\frac{1}{4}$ mile. They are easily constructed without the aid of expensive tools, and with care will last a considerable period. Below are full measurements, details, &c. :—

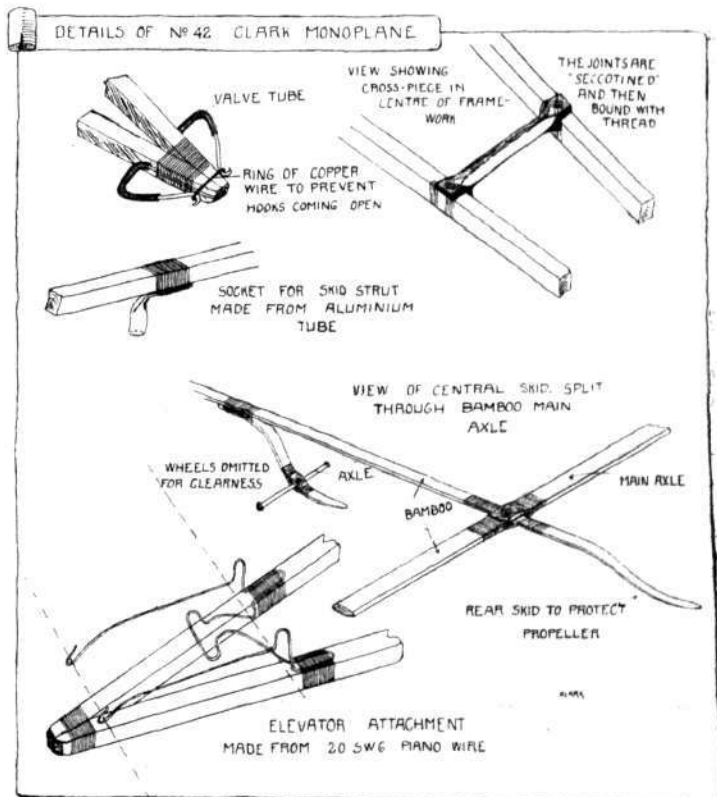
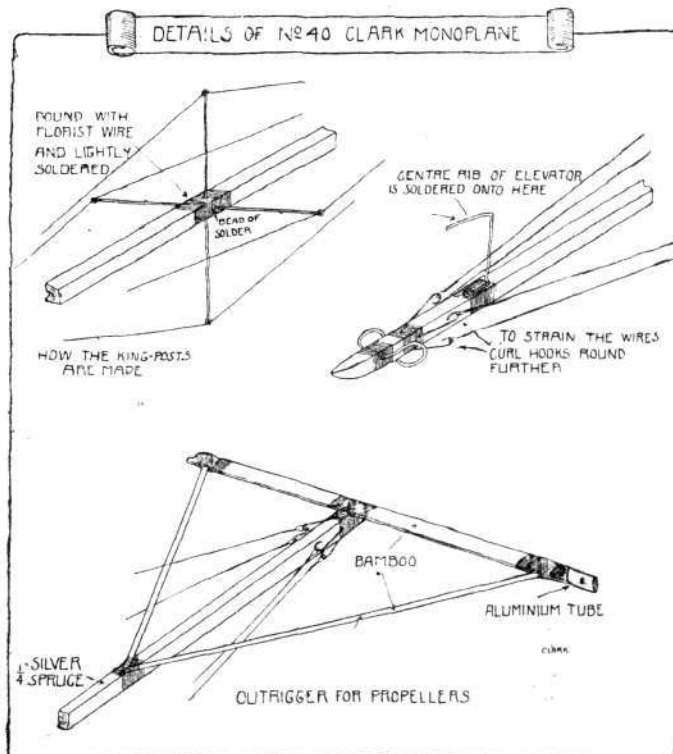
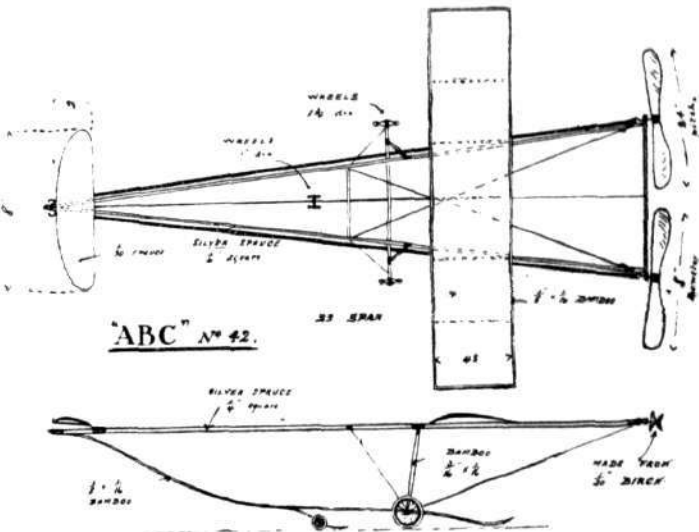
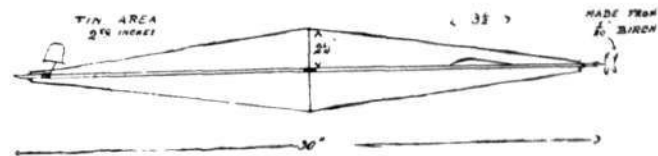
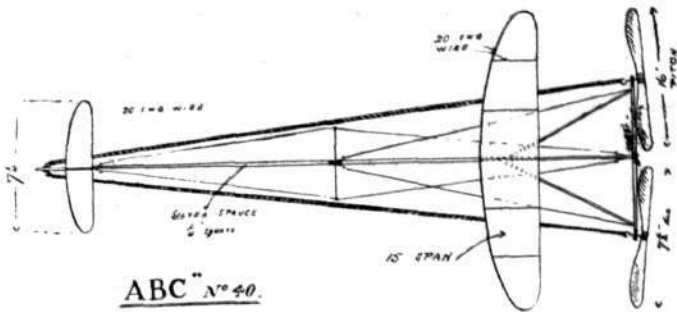
| Model No. | Length of Frame. | Propellers (2). | Power. | Dimensions. | | Weight. | Revolutions (each Screw). | Distance. |
|-----------|------------------|------------------|-----------------------|-------------|-----------|---------|---------------------------|------------|
| | | | | Main Plane. | Elevator. | | | |
| 40 | 30 ins. | 7½ dia. 16 pitch | 8 strands 1½ in. sq. | 15 × 3½ | 7½ × 1½ | 2½ ozs. | 1000-1200* | 500 yards. |
| 42 | 32 ins. | 8 dia. 24 pitch | 14 strands 1½ in. sq. | 22 × 4½ | 8 × 2 | 4½ ozs. | 950† | 440 |

* The planes are made of 20 S.W.G. wire, and covered with proofed silk.

† The planes are made as per sketches; the wheels are taken off a cheap toy.

No. 42 leaves the ground after a run of 8 or 9 ft. Trusting these particulars will interest some of your numerous readers.
Brockley, S.E.

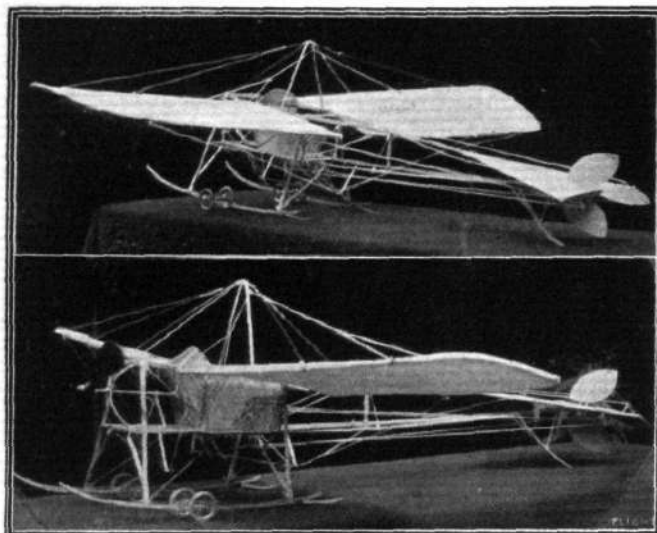
"KLARK."



An Interesting Control Mechanism.

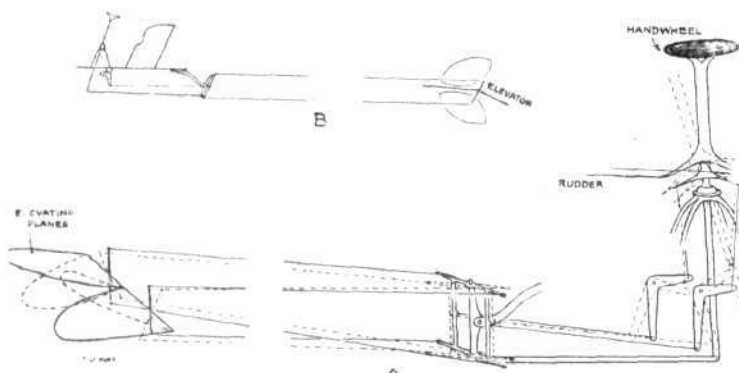
[1489] Enclosed are two photographs and diagram illustrating the latest Holt monoplane (scale model $\frac{1}{10}$ full size) constructed for the Glasgow Exhibition.

It follows principally on the lines of the famous existing types, but



differs from them in the warping control, a device having been introduced by which the elevators being cloven operate in conjunction with the main wings.

The method for operating the elevators will be seen by Sketch A. The whole control is taken off one column, and consists of a centre



column swung on a ball-joint, which gives a universal movement, and when moved forward or backward moves the elevators in the orthodox manner (see B on diagram), but when moved from side to side the warping is effected.

This in no way detracts from the power to ascend or descend, as all movements coincide.

It is claimed that greater power over the control is the result of this introduction, which makes a form of screw-dart of the elevators, and helps to steady a machine when inclined to roll.

G. Chiswick. JNO. J. HOLT.



From Johannisthal to Lake Muggel.

RISE from the Johannisthal aerodrome on Sunday afternoon on his monoplane, fitted with an automatic stability control, Folkner flew over to Lake Muggel, and landed on the frozen surface of the lake. Later in the day he returned on his monoplane to Johannisthal.

Wireless Experiments in Germany.

THE German military authorities have been closely watching some experiments made at Johannisthal with an apparatus for transmitting and receiving wireless telegraph messages on an aeroplane. It is stated that communications have been made with stations 55 and 100 miles away. The experiments are to be continued at Doeberitz Camp, and it is possible the Kaiser may witness some of them.

A Mishap at Johannisthal.

ON the 2nd inst., while flying at Johannisthal, a serious accident befell Lieut. Loewer, his machine suddenly dropping from a height of 40 metres. It was, of course, smashed, and the aviator sustained a broken leg and arm, besides internal injuries.

More Aerodromes in Germany.

MANY of the municipalities in Germany are fully alive to the importance of encouraging aviation. At Gelsenkirchen a sum of £15,000 was voted the other day for the acquisition of a flying ground at Rotthausen, and the local authorities at Herteu and Waune, in Westphalia, propose spending £7,500 on a ground at Bochum.

The Italian Government and Aviation.

AT a meeting of the Commission appointed by the Italian War Minister to consider the question of developing aviation in Italy, it was decided to organise two national competitions, one for aeroplanes, designed and constructed in Italy by Italian makers, and the other for Italian aeroplane motors. It will be permissible for foreign engines to be used on the aeroplanes, but preference will be given to those entirely of home construction.

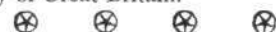
A Bomb-Thrower Wounded.

THAT it is possible for passengers on aeroplane to be hit by rifle fire was proved at Tripoli the other day. On the 31st ult., Rossi took Capt. Montu from Tobruk over a large Arab encampment for the purpose of dropping some bombs. The aeroplane was hit by four bullets—one of which slightly wounded Capt. Montu—from the enemy's rifle.

The Index to Vol. III of FLIGHT (1911) is now ready. Price 3d. (post free 4d.) of the Publishers, 44, St. Martin's Lane, W.C.

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Aerial Science, Ltd., 53, Victoria Street, Westminster, S.W. —Capital £1,000, in 20 shares of 1s. each and 999 shares of £1 each. Formed to foster and encourage the science of aeronautics in all its branches, and to enter into certain contracts with the Aeronautical Society of Great Britain.



Aeronautical Patents Published.

Applied for in 1910.

Published February 8th, 1912.

26,831. G. M. BELLASIS. Flying machines.

Applied for in 1911.

Published February 8th, 1912.

7,592. H. T. ALESBURY. Under-carriage for aerial machines.
7,594. H. T. ALESBURY. Side steering and lifting planes.
12,740. H. COANDA. Propellers.
14,926. E. J. BIGOURDAN. Helicopter flying machines.
21,130. K. WILLEMS. Steering and balancing.
21,868. L. C. BADEAU. Air-ship.

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